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Contents

NOTICES.—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.*

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Chemical Engineers at Tokio

THE Institution of Chemical Engineers deserves thanks for collecting together the eight papers presented by members of the Institution at the World Engineering Congress in Tokio last autumn, and offering the bound set at half-a-guinea. The papers are short, practical, and thoroughly sound, and many unable to attend the congress will be glad to have them in so convenient a form.

Professor J. W. Hinchley, the Honorary Secretary of the Institution, deals succinctly with "The training of the chemical engineer." No better authority, whether as to theory or as to practice, could be found. It is rightly insisted throughout the paper that a chemical engineer should have not only a knowledge of fundamental science, but special knowledge of experience of large scale chemical manufacture, and, further, that, as manufacturing processes cannot be carried out without commercial profit, he should also understand industrial economics and factory management. Dr. A. J. V. Underwood discusses very thoroughly "The mathematical theory of filtration," and incidentally illustrates how essential a mastery of the pure mathematics of such problems is.

Mr. P. Parrish, a recognised authority well-known to our readers on gasworks by-product problems, takes up the question—"Is it profitable for gas undertakings to manufacture concentrated gas liquor rather than to dispose of gas liquor as such to chemical works at some distance and incur expenses for its removal?" His conclusion, after a careful survey, is that, subject to each case, with the local circumstances, being considered on its merits, it should be profitable for gasworks to adopt a process for the concentration of gas liquor and to supply a product containing 15-16 per cent. of ammonia. Two new types of silicon iron acid pumps, recently developed by the author at the works of Guthrie and Co., Accrington, are described by Mr. Walter Hayhurst, namely, the centrifugal pump, which he considers the best, and the plunger pump.

Mr. J. T. Dunn, in his paper on "Pulverised fuel," indicates the conditions that a satisfactory pulverised fuel should be expected to satisfy and the general advantages of powdered fuel firing. Mr. C. J. Goodwin, who has long given attention to the subject, deals with "Briquetting with smokeless pulp binders," and indicates incidentally its possible application to Japanese conditions. Mr. T. M. Davidson's paper on "Treatment of oil shales" discusses various processes and types of plant for the purpose. Finally, Dr. F. S. Sinnatt, who has given much study to the structure of coal seams and the constitution of the coal substance, discusses "The industrial importance of the heterogeneous character of coal seams"—a paper that incidentally illustrates what a large field the chemistry of coal has become. It has been impossible here to do more than note the general scope of these papers, but enough has been said to indicate their value and the wisdom of making them available to students of the various subjects.

Benzol Producers' Conference

THE second international conference of benzol producers, held at the Grosvenor House Hotel, London, on Friday and Saturday of last week, was of a very representative character. The delegates attending came from Belgium, Czechoslovakia, France, Germany, Great Britain, Holland, Italy, Poland, and Spain. They were received by the President (Sir David Milne-Watson), President of the National Benzol Association, and the Conference was opened by a speech of welcome by Monsieur H. Laurain, President of the International Conference of Benzol Producers. Sir David Milne-Watson in his address outlined the remarkable progress which had been made in the production of benzol during recent years, principally in Great Britain and Germany, and, in dealing with the distributing, marketing and propaganda aspects of the position in Great

Britain, he suggested to the other countries represented that they might form a basis for the exploitation of benzol in their respective countries.

Five important papers were read dealing with "Motor fuels for high compression engines," "Resin formation in motor spirits," "Estimation of gum in motor benzols," "The European benzol market position," and "Sales organisation." These were followed by a film depicting what had been done to popularise the use of British-produced benzol in Great Britain. During luncheon, speeches were given by Sir David Milne-Watson, Monsieur Laurain, Mr. S. Henshaw, F.I.C. (Chairman of the National Benzol Co., Ltd.), and a number of foreign delegates. The conference, which concluded with a visit to the distribution depots, research stations, and various transport workshops of the National Benzol Co. was regarded as an important step towards the international consolidation of benzol industry and the development of a common policy embracing all aspects of it.

Faraday Centenary Celebrations

A FEW years ago Michael Faraday's achievements in chemistry, especially his isolation of benzene, were fittingly celebrated by the Royal Institution. On August 29, 1831, in the course of experiments on the induction of electric current, he made the discovery which led to the dynamo and became the starting point of the use of electrical power and the basis of the electrical industry. Next year, appropriately on the initiative of the Royal Institution, with the co-operation of the Institution of Electrical Engineers and other bodies, the centenary will be celebrated of one of the most important and fruitful experiments in physical science. In addition to the Royal Society and the British Association, it is satisfactory to find that chemistry will be represented in these celebrations, for Faraday's chemical researches, his work on the condensation of gases, his isolation of benzene, and his establishment of the laws of electro-chemistry, were scarcely less notable than his purely electrical discoveries. Among the co-operating bodies are the Physical Society, the Chemical Society, the Faraday Society, the British Science Guild, the Institute of Physics, the Society of Chemical Industry, the Department of Scientific and Industrial Research, and the Chemistry Research Board.

The programme at this stage is not, of course, complete, but it will include a reception of delegates at the Royal Institution from all parts of the world, a Faraday commemorative meeting in the Queen's Hall, and a Faraday exhibition in the Albert Hall. The celebrations will begin on Monday, September 21, and will continue over several days. Among those serving on the various committees are Sir Robert Robertson, Sir William Bragg, Dr. F. E. Smith, Professor H. E. Armstrong, Professor T. M. Lowry and Mr. Emile S. Mond.

"It is So"

THE other week attention was drawn to some curiously ill-informed notions prevalent among members of the House of Commons as to the Dyestuffs Act and the industry in general. A correspondent sends us another example, taken from a popular weekly that modestly claims that if any statement appears in its authentic pages "it is so." Here we are gravely informed that the "Dye-Stuffs" Act "gives a measure of protection to certain branches of our textile industries," and that a Government reprieve of the measure will probably shortly be announced. On the last occasion, the theory was that the Act was the cause of the depressed condition of the British textile industry. Now it is converted into a bulwark of the industry, and since this "is so," one should not be surprised to see Lancashire organise a procession through the capital in defence of the Dyestuffs Act as it used to do in defence of its Church schools!

Lord Brotherton's Great Gift

LORD BROTHERTON'S munificent benefactions to the University of Leeds, and to many other public institutions and causes with which he has been associated, are now to be further enlarged—it is premature to suggest that they will even now be concluded—by one of the noblest donations it is possible for a public man to make. On the 24th of this month, when he lays the foundation stone of the new library of the University of Leeds, which he made possible by an earlier gift of £100,000, he will hand over his own magnificent collection of books to become the property of the nation, accompanied, it is understood, by an endowment fund for the upkeep of the library estimated at another £30,000.

The scale of Lord Brotherton's benefactions would in itself be impressive, but even more are the noble objects he has selected a matter for congratulation and emulation, for they illustrate how in the course of a strenuous business career, mainly concerned with chemical manufactures, the love of literature, art, and science has not only survived, but remained predominant. The value of Lord Brotherton's immense library it would be difficult even for the expert to fix, but his latest gift is probably the noblest in this field since the establishment of the Rylands Library in Manchester as a memorial to a great Manchester merchant. It is, indeed, rather notable that though Lord Brotherton was born just outside Manchester, his business activities and public work have been identified with Yorkshire and especially with Leeds. If Manchester and its University have thus missed the great advantage of his interest, the gain at least has passed to a sister constituent of the old Victoria University, and to an almost equally famous centre of the northern textile industry.

Books Received

ECONOMIC CONDITIONS IN CHILE, NOVEMBER, 1929. Report by E. Murray Harvey. London: H.M. Stationery Office. Pp. 104. 3s.

THE NATIONAL BENZOLE ASSOCIATION. Report of the Benzole Research Committee, 1930. Pp. 148.

INSTITUTION OF CHEMICAL ENGINEERS. Papers presented by Members at the World Engineering Congress, Tokio, 1929. 10s. 6d.

The Calendar

June		
12	Royal Society. 4.30 p.m.	London.
19	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.
27	National Physical Laboratory: Visit of Inspection. 3 to 6 p.m.	Teddington.

A New Refrigerant

To the Editor of THE CHEMICAL AGE.

SIR,—Articles appearing recently in chemical journals concerning dichlorofluoromethane as a new refrigerant have attracted my attention, and I think the following may prove of some value to the refrigerating world.

For years refrigerating engineers have complained of the toxicity and inflammability of the refrigerants they have been using. I cannot help but draw your attention to the fact that if engineers built a machine that would not allow the refrigerant to escape there would be no more trouble.

In practically every machine, for whatever purpose designed, trouble has been met with in the initial stages, as for example, steam and petrol engines, multitubular boilers, domestic coal-gas and electrical installations, lightning conductors, etc. Let us not forget the miniature explosions and earthquakes in various areas of London due to defective or worn-out gas installations. All media employed should have their proper positions assigned to them, and be kept there. Even the wild animals in the Zoological Gardens are not allowed to roam about, and I fail to see why refrigerating machine builders should claim exemption from using proper care in confining the contents of the machine and why they attach the blame to anything but the machine. Their complaints would cease if they overcame the trouble of leakage.

I am acquainted with a means of producing intense cold, a fall of temperature from +40° F. to —40° F. in 10 minutes, and maintaining it without compressors or motive power. The cold is produced by existing refrigerants which are non-acid, are non-inflammable, and are not allowed to escape, as there are no movable parts. To my mind it would be preferable to test and thoroughly investigate this process instead of experimenting with a new refrigerant such as dichlorofluoromethane, about which there are at present no definite data or continuous working results available.

I say this in view of similar trials which were made with such products as propane and butane some years back. As far as I remember, these substances were not readily available in sufficient quantities everywhere in the world to warrant their universal adoption. This is not the case with the media employed in the above-mentioned device. Yours, etc.,

ALBERT HENNING,
(Chairman and Managing Director,
Hedley and Co. (Leytonstone), Ltd.)

Leytonstone, May 30.

Chemical Practitioners and Advertising

To the Editor of THE CHEMICAL AGE.

SIR,—There is an increasing volume of opinion which, if not actually in favour of advertising among professional men, yet considers that it ought not to be regarded as an act of professional misconduct; while not a few consider that the veto upon advertising is now completely out of date and ought to be entirely abolished.

These opinions are undoubtedly influenced to some extent by the fact that no strict definition exists as to what constitutes advertising among chemical practitioners. It is, of course, clear that an advertisement which solicits clients comes within the veto, and a displayed notice of a practitioner's name, with paraded qualifications is in the same category. There exist, however, subtler methods which introduce many difficulties. One of these is undoubtedly the published report accompanying, for example, a prospectus.

In this case the practitioner is advertising not himself, but the products he has examined, and while this should never be, and very seldom is, the motive of the report itself, its use in this connection is open—under the recognised traditions regarding advertising, at any rate—to misunderstanding. It is generally agreed, however, that if a report is submitted it can be published, and if a practitioner refuses such a concession his client will probably retain some other who will not.

If the first two examples quoted are an infringement of the letter, the last is no less one of the spirit. It does seem necessary that either the definition regarding advertising should be made rigid as in the case of the medical profession, or that the veto on advertising should be abolished altogether.

The Institute of Chemistry and the British Association of Chemists are both opposed to advertising, but the latter holds the view that some clearly recognised definition of it ought to be laid down, or alternatively that the whole question should be reconsidered, having regard to the body of opinion which holds that reconsideration is overdue. It will be interesting to hear the views of other correspondents on this subject.—I am, etc.

HENRY T. F. RHODES.

British Association of Chemists, June 2.

"Sea Coal and Soot"

To the Editor of THE CHEMICAL AGE.

SIR,—That interesting editorial note in your issue of May 24 on "Sea Coal and Soot," prompts us to enclose a report on our experience here in profitably utilising the gases which cause the deplored nuisance. Eminent experts are agreed that no complete combustion can take place without pre-heated air. Therefore, we simply environ the incandescent fuel with it, when automatically the flame overlapping the fire-bridge ignites the gases with the narrated results, due to the application of ordinary common sense, a gift generally regarded as so abundantly supplied that our neighbours are liberally provided with our surplus. Nevertheless, it seems that "a soot fall of six hundred tons per square mile" is permitted in the city of London each year to poison the vital atmosphere instead of being profitably utilised. We are, etc.,

JOHN MUIR AND SON.

Beith, Scotland, May 29.

[ABSTRACT FROM REPORT.]

By a process in successful use for two years in Beith without the cost of any intermediae distillation, poisonous gases are ignited and utilised for heat raising and without smoke. The recent inspection of the Glasgow representative of the Government Scientific and Industrial Research Department resulted in another deputation direct from London headquarters, accompanied by their chief engineer. He specially studied here the working of the system. He expressed his approval and satisfaction that the claims made for it were fully substantiated, so much so that they propose to erect a duplicate of this system at their large fuel research demonstration works, near London, so that it can become more widely known and more conveniently reached and demonstrated than here.

Here is confirmation of the consensus of opinion of innumerable visiting furnace owners as expressed by probably the firm most largely interested in coal in Scotland. They write "You have the right end of the stick and we compliment you on your intimate acquaintance with the subject, as well as the simplicity and perfection of the cure." The Medical Officer of Health, after the visit of the experts of Glasgow Corporation, reported on the system "as undoubtedly a successful means of preventing smoke from furnaces." Efforts at smoke elimination have hitherto been deterred by the high cost to the furnace user of remedies, some of which prove abortive, and many but partially successful. In this process, constructional cost is trivial, because of its simplicity. There is such marked economy in the coal bill as to make the system immediately profitable from the day of adoption. It can be seen in operation during any working hour at the tannery of John Muir and Son at Beith.

Affairs of British Felspar, Ltd.

IN the compulsory liquidation of British Felspar, Ltd., 104, High Holborn, London, which was formed to carry on the business of artistic and commercial cellulose spraying, the statutory meetings of the creditors and of the shareholders were held on Thursday, May 29, at the Board of Trade Offices, 33, Carey Street, London. A statement of affairs was submitted showing liabilities £667 (ranking £603), assets £94, a deficiency of £508 with regard to the creditors, and a total deficiency of £3,008 with reference to the shareholders. The winding-up order was made on May 5 on the petition of Ralph Bentley, paint and lacquer manufacturer, Queen Street, Croydon, trading as B.M.B. Nitrocellulose Lacquers, a creditor for £50. It appears that the company was formed with a nominal capital of £2,500, divided into 1,000 preference shares of £1 each and 30,000 ordinary 1s. shares. As a result of the meetings the liquidation remained in the hands of the Official Receiver.

Sensitisation of Ammonium Nitrate by Nitrostarch

By G. St. J. Perrott, D. B. Gawthrop, and C. A. Taylor

This paper, prepared by three officers of the Pittsburgh Experiment Station and based on the U.S.A. Bureau of Mines Report of Investigations 2,987, presents data obtained during an investigation of the sensitising action of nitrostarch in mixtures of ammonium nitrate containing low percentages of this material. Data were derived as to the sensitivity to decomposition by heat and the completeness of detonation and rate of detonation of straight ammonium nitrate, as compared with ammonium nitrate-nitrostarch mixtures containing 1 to 10 per cent. of nitrostarch.

THE ammonium nitrate used was a sample of coated material obtained from the salvage of amatol shells. Its analysis was as follows:—Moisture, 0·26 per cent.; chlorides, 0·67 per cent.; sulphates, 0·35 per cent.; oils or grease, 0·24 per cent.; evaporated residues as sulphates, 1·57 per cent.; insolubles, 0·63 per cent.; ammonium nitrate, 96·28 per cent. The nitrostarch was obtained from a nitrostarch dynamite by dissolving off the salts (NH_4NO_3 and $NaNO_3$), washing and drying.

Behaviour at Elevated Temperatures

A. Unconfined.—The loss in weight of 10-gram samples of ammonium nitrate, nitrostarch and mixtures of ammonium nitrate and 1 per cent. nitrostarch was determined by heating the samples contained in beakers in an electric oven for the times and at the temperatures indicated in Table 1. All samples had been dried at 45–50° C. before the tests were begun. Determinations were made in duplicate.

TABLE 1.—*Effect of elevated temperature on ammonium nitrate, nitrostarch, and mixture containing 1 per cent. nitrostarch.*

Temperature, °C.	Time, hours	Loss in weight, expressed in per cent. Ammonium nitrate	Nitrostarch	Ammonium nitrate plus 1 per cent. nitrostarch
75	8	0·05	0·27	0·05
		0·05	0·25	0·06
75	48	0·08	0·52	0·09
		0·10	0·46	(1) 0·10
100	48	0·65	(2) 100	1·03
		0·70	(2) 100	(1) 1·01
120–130	1	0·40	(3) 100	0·60
		0·35	(3) 100	(1) 0·55
140–150	1	0·48	(4) 100	0·85
		0·45	(4) 100	0·92
150–160	1	0·62	100	(1) 1·44
		0·75	100	1·72

(1) Sample made by moistening mixture and drying with agitation. (2) Fired in 27 hours. (3) Fired in 35 minutes. (4) Fired in 12 minutes.

The results do not indicate that the decomposition of ammonium nitrate at elevated temperatures is affected by the presence of nitrostarch or ammonium picrate. Although the nitrostarch fired when heated alone at temperatures above 100° C. it decomposed quietly under the same conditions when 1 per cent. was mixed with ammonium nitrate and did not affect the ammonium nitrate.

Further experiments were made on mixtures containing 3 to 9 per cent. nitrostarch, as shown in Table 2.

TABLE 2.—*Effect of elevated temperature on ammonium nitrate-nitrostarch mixtures containing 2·9–9·1 per cent. nitrostarch.*

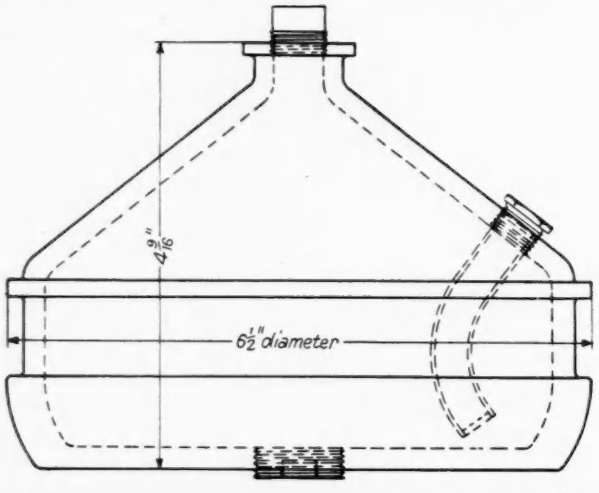
Nitrostarch per cent.	Temperature °C.	Time, minutes.	Loss in weight, per cent.
2·9	150–155	60	1·9
2·9	150–155	60	1·5
2·9	155–160	120	3·4
2·9	155–160	120	3·0
3·8	155–160	60	3·9
3·8	155–160	60	4·1
4·8	145–155	60	3·8
4·8	145–155	35	Fired
9·1	120–135	90	Fired
9·1	145–155	25	Fired

Except when the material fired the results do not indicate any large influence of nitrostarch on the decomposition of ammonium nitrate. The loss in weight of the mixture was either less or only a few tenths of 1 per cent. greater than the total percentage of nitrostarch in the mixture. In the samples that fired a considerable amount of ammonium nitrate remained in the beaker. The portion lost was due in part to decomposition and in part to loss through frothing out of the beaker. Nothing approximating a detonation was observed in any of the experiments.

B. Tests under confinement.—To determine the effect of confinement such as might occur in the crystallisation of ammonium nitrate in a vacuum grainer, miniature grainers were made of cast iron (illustrated). A heating element of nichrome wire made it possible to raise the temperature of the grainer, which was measured by means of copper-constant in thermocouple in the thermocouple well. The charge was 300 grams of ammonium nitrate or a like weight of a mixture of ammonium nitrate and nitrostarch containing 1, 5 and 10 per cent. respectively, of nitrostarch. Test results were as follows:—

Tests Using 300 Grams of Ammonium Nitrate

Test 1.—Heated 1 hour 38 minutes. Maximum temperature recorded before burning out of thermocouple, 205° C. Ammonium nitrate ran out through thermocouple tube in



molten condition. No explosion. Smoke and fire at end of test.

Test 2.—Heated 1 hour 30 minutes. Approximate maximum temperature, 160° C. Thermocouple out of order. No smoke, fire or leakage of ammonium nitrate. No explosion.

Test 3.—Heated 6 hours 38 minutes. Average temperature 143° C.; maximum temperature, 151° C. No apparent smoke, fire or leakage of ammonium nitrate. No explosion.

Tests Using 300 Grams of Ammonium Nitrate Containing Nitrostarch

Test 4.—*Percentage of nitrostarch present,* 1.—Heated 1 hour 10 minutes. Ammonium nitrate leaking out at thermocouple tube at 162° C. Fire and smoke observed with thermocouple reading 185° C. Burning ammonium nitrate on floor with temperature inside grainer of 213° C. Explosion immediately after a temperature reading of 237° C. Explosion merely took off the top of the grainer.

Test 5.—*Percentage of nitrostarch present,* 5.—Heated 50 minutes. No smoke, loss of ammonium nitrate or warning of any kind before explosion. Temperature reading before explosion occurred, 147° C.

Test 6.—*Percentage of nitrostarch present,* 10.—Heated 55 minutes. No smoke or warning before explosion. Temperature one minute before explosion occurred, 155° C.

General Results

No detonation or explosion was recorded in the miniature grainers with the sample of coated ammonium nitrate used. Heating the ammonium nitrate for more than six hours and up to a temperature of 205° C. caused decomposition of the ammonium nitrate. Decomposition was not rapid enough

for the gases evolved to build up enough pressure to break the grainers.

Addition of 1 per cent. of nitrostarch accelerated decomposition sufficiently to break the grainer with a partial detonation. The mixture had broken through the thermocouple tube and was pouring out and burning on the floor, when the material inside the grainer partially detonated, breaking the grainer in two pieces. Addition of 5 or 10 per cent. nitrostarch accelerated decomposition more rapidly. Explosions took place without warning or apparent leakage of material from the grainer previous to a partial detonation.

The results show that, under confinement, nitrostarch acts as a sensitizer of ammonium nitrate when present in quantities of 1 per cent. and higher.

Explosive Properties of Ammonium Nitrate-Nitrostarch Mixtures

A. Compression of lead block.—As an indication of the percussive effect of ammonium nitrate and mixtures containing nitrostarch the authors measured the compression of lead blocks after charges had been detonated in contact with the blocks. The test procedure was as follows :—

Manila paper was wrapped around and above the upper end of a lead cylinder 1½ in. in diameter and 2½ in. in height. Immediately on top of the lead cylinder was placed an annealed steel disk 1½ in. in diameter and ¼ in. in thickness. Fifty grams of the sample under test were loaded in the paper container at an average density of 0·83. Above the test sample a booster of tetryl weighing 25 or 50 grams, depending on the test, was loaded at a density of 1·00. The tetryl booster was fired with a No. 8 electric detonator.

Table 3 is a record of the individual test results and the corrections for the effect of boosters and detonators.

The lead-block tests with ammonium nitrate-nitrostarch mixtures show a marked increase in percussive effect with the addition of 1 per cent. of nitro-starch, the compression of the lead-block increasing from 0·85 to 3·25 mm. when using a 25-gram tetryl booster, and increasing from 2·90 to 4·25 mm. when using a 50-gram tetrul booster. Nitrostarch over 1 per cent. shows a regular increase in lead-block compression.

The final conclusion reached was that the addition of nitrostarch to ammonium nitrate in quantities of 1 per cent. and higher increases the sensitivity to explosion at elevated temperatures under confinement, and increases the completeness and speed of detonation when the mixture is detonated by a tetryl booster.

TABLE 3.—*Lead-block tests of ammonium nitrate mixed with small percentages of nitrostarch.*

Nitrostarch added to ammonium nitrate, per cent.	Density, g./c.c.	Lead-block compression. Gross, mm.	Blank, mm.	Net, mm.	Average net mm.
A. 50 grams of ammonium nitrate and 25-gram tetryl booster.					
0	0·83	1·50	0·75	0·75	
	0·81	1·50	—	0·75	
	0·86	1·75	—	1·00	0·85
1	0·80	4·25	—	3·50	
	0·70	3·75	0·75	3·00	3·25
2	0·83	5·25	—	4·50	
	0·83	5·75	0·75	5·00	4·75
3	0·86	6·50	—	5·75	
	0·84	6·25	0·75	5·50	5·65
4	0·88	7·50	—	6·75	
	0·86	7·50	0·75	6·75	6·75
5	0·85	8·75	0·75	8·00	8·00
B. 50 grams of ammonium nitrate and 50-gram tetryl booster.					
0	0·84	4·25	1·25	3·00	
	0·86	4·50	—	3·25	
	0·80	3·75	—	2·50	2·90
1	0·82	6·00	—	4·75	
	0·70	5·00	1·25	3·75	4·25
2	0·86	6·25	—	5·00	
	0·83	7·25	1·25	6·00	5·50
3	0·86	7·25	—	6·00	
	0·84	7·75	1·25	6·50	6·25
4	0·86	9·25	—	8·00	
	0·85	9·25	1·25	8·00	8·00
5	0·86	9·75	1·25	8·50	8·50

B. Rate of detonation.—Rate of detonation determinations were made in Shelby steel tubes of the following dimensions :—Inside diameter, 1–1/32 in. ; thickness of wall, 3/16 in. ; length, 21 in. The rate was measured over a 35 cm. length of explosive, using a Mettegang recorder. The ammonium nitrate-nitrostarch mixtures were loaded to an average density of 0·82. Detonation was made with a 100-gram tetryl booster and No. 8 electric detonator.

Results of rate of detonation tests are given in Table 4 :—

TABLE 4.—*Rate of detonation of ammonium nitrate-nitrostarch mixtures in Shelby steel tubes.*

Nitrostarch in ammonium nitrate, per cent.	0	1	2	5
Density of loading, g./c.c.	0·82	0·81	0·78	0·86
Rate of detonation, meters/sec.	1,850	1,940	2,060	2,470

Maiden Trip of the New Thames Ferry Boat "John Benn"

SIR ERNEST BENN AND MRS. WEDGWOOD BENN (WIFE OF THE SECRETARY OF STATE FOR INDIA) WITH A PARTY OF BOYS FROM THE JOHN BENN HOSTEL, PHOTOGRAPHED DURING THE FIRST TRIP OF THE "JOHN BENN" ACROSS THE THAMES AT WOOLWICH (SEE PAGE 537).

Laboratory Bench Design

By Norman Evers and Thomas McLachlan

During the last few years, the authors of this paper have supervised the equipment of two new laboratories and have had to consider the design of benches which, while economical in floor space and adaptable for various purposes, were easily moved. The advantages of movable benches in which the process of breaking and remaking unions is reduced to a minimum, is especially great in laboratories where the changing nature of the work or periodical increases in staff necessitate rearrangements.

Two benches which the authors have found most convenient, and which may be of service to other chemists in the equipment of their laboratories, are described here. They are not intended to supersede the time-honoured benches with teak tops. It has been found incidentally that the latter type is more useful in a commercial laboratory without any kind of sink fitted whatever. Small sinks are useful only when it is required to cool liquids in flasks or beakers rapidly. For most purposes, taps may be fitted on the wall at the end of the bench and may hang directly over a gully of the half closed U type running along the wall above the floor level. Water pumps and blowers can be fitted directly to these taps, and allowed to discharge directly into the gully with waste water from condensers.

Size of Benches

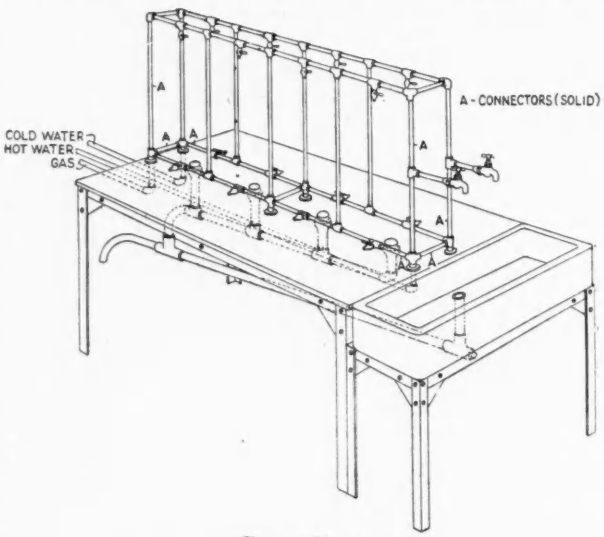
The size of the benches illustrated is 8 ft. by 3 ft. by 3 ft. 2 in. high; it has been found that 8 ft. is the most useful size for a teak bench and one of these special benches may be fitted between two such wooden ones without interfering with the general alignment of the laboratory. Of course, they could be made larger or smaller as desired—smaller ones are not of much practical use unless fitted against a wall, and larger ones are somewhat unwieldy. The benches here described are made of 2 in. angle-iron frames with cement asbestos tops 1 in. thick. These tops can be made by Bell's United Asbestos Co., but special attention must be paid to the surface finish. Cement asbestos possesses great advantages as a material for bench tops. It is light, not readily attacked by acids or alkalis, not affected by heat, can be drilled or sawn with comparative ease and does not present such a hard surface as slate, marble or concrete, so that the mortality of glassware should be lower. The frames are fastened together with bolts with countersunk heads in order that the surfaces shall be flat.

It has been found best to fit large sinks at the end of each of the benches facing the passageway of the laboratory. A convenient size is 3 ft. by 2 ft. by 10 in. deep, and although it may be thought at first that this size is rather large, in practice it has been found most useful. The frames of the sinks are made separately from the main benches and are bolted to them. It is unnecessary to fasten the sinks in any way, as it will be found that their own weight, coupled with the steadying effect of the waste pipe, is sufficient to keep them in position. The makers of the sinks should be requested to place the baking pins at the rear of the sinks so that they do not show. Hot and cold water taps, $\frac{1}{2}$ or $\frac{3}{4}$ in., as desired, are fitted, or a hot and cold water mixer may be substituted. Whichever system is used it will be found very convenient if the taps are fitted with screw unions so that a hose may be attached. A short piece of hose will be found useful for many washing purposes.

Of the two benches described, Bench No. 1 is intended for general analytical work such as small distillations and Soxhlet extractions, while Bench No. 2 will be found useful for larger operations such as solvent recovery, the distillation of large quantities of liquid, vacuum distillations and similar operations. The apparatus required for many operations, when assembled on an ordinary bench, is often top-heavy and at the same time difficult to handle. The use of the adjustable brackets on Bench No. 2 makes it possible to give firmer support to the upper portion and at the same time brings the whole nearer the ground.

For General Analytical Work

Bench No. 1, as shown in the first diagram, is fitted with a superstructure 2 ft. 6 in. high by 5 ft. 10 in. long and 6 in. wide, the outer framework being constructed of $\frac{1}{2}$ or $\frac{3}{4}$ in. pipe capable of carrying gas, hot and cold water and waste water in different sections of the framework all at the same time. The use of right and left-handed threads in the assembling of this framework improves its final appearance, as it avoids the use of collars and backnuts. Six $\frac{3}{8}$ in. stainless steel, brass or gunmetal rods are provided to be used instead of retort stands. It will be seen that cold water enters the framework 2 in. below bench level and runs immediately to the top circuit, supplying the small taps and finally the large tap over the sink. Gas enters at the same level as the cold water, but flows on the lower circuit to the taps. Hot water is also introduced at the same level, but runs along a pipe under the bench and then to the tap over the sink. Small



BENCH NO. 1.

holes are provided for waste water from the bench and 1 in. to $\frac{1}{2}$ in. reducing sockets are connected to the waste pipe which runs along under the bench and is connected to the main waste pipe from the sink. This waste pipe is of $1\frac{1}{2}$ in. barrel and is fitted with a T piece at each end and plugged so that the plugs can be removed for cleaning purposes. The waste pipe is bent so that the outrush of water shall be in the direction of the gully flow. Pipes are blanked off at A in order to separate hot and cold water and gas. Eight $\frac{3}{16}$ in. gas and water taps are fitted. It will be noticed that cross-pieces have been inserted at the middle of each of the top and bottom frames. The lower one is necessary to allow gas to flow into the rear of the bottom circuit, while the top one gives support and adds symmetry to the whole. The framework as a whole is fixed to the bench with washer plates and nuts. The various unions may be painted different colours so that, at any future time, should it be necessary to attend to the fittings, it can be seen at once which part of the circuit needs attention. In fact, it is a good rule to adopt this practice throughout the laboratory and factory, so that all pipes may be readily traced. A strap runs across the middle of the angle iron frame to give added support to the top.

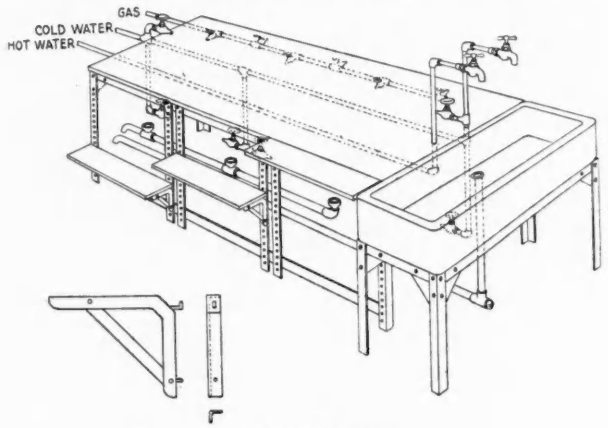
Bench for Larger Operations

Bench No. 2 is fitted with a top 6 ft. by 2 ft. and is 3 ft. 2 in. high. As will be seen from the diagram, three adjustable brackets are provided, each measuring 2 ft. by 1 ft., and when they are adjusted in their top position the total surface of the bench is increased to 6 ft. by 3 ft. Each of the adjustable brackets can be lowered to within 9 in. of the floor, two inches at a time, or they may be removed completely, if desired.

Reference to the diagram will show that six uprights are provided with holes 2 in. apart to carry the brackets, the first hole beginning 1 in. below the top of the frame. The usual stays and supports are given to ensure rigidity and also to keep the uprights parallel. The whole frame is fastened

together with countersunk screw bolts to ensure that there shall be nothing projecting. The holes for the brackets are ½ in. in diameter. The brackets themselves are right angles, having the top 10 in. long and the back 8 in., with a hook 1 in. below the top edge and a stud 7 in. below. Two such brackets are strapped together in parallel so that they will fit into the holes in each pair of uprights. The brackets must be made and the uprights drilled carefully so that the former will fit easily and hang level. It is well that they should do so as it is inadvisable to have any undue strain on the hooks. When properly made, they should carry any load up to one hundred pounds easily.

Hot and cold water services are run just under the top to supply ½ or ¾ in. taps at the sink, or a hot and cold water mixer if required. No fittings are allowed on the surface, which must be quite clear. Most of the cold water supply to this bench will be required below bench level and the $\frac{3}{16}$ in. taps are therefore placed as shown in the diagram. The gas pipe has three taps pointing towards each side of the bench. The waste pipe from the sink is of 1½ in. barrel, as in the case of Bench No. 1, and is fitted with T-pieces and plugs for



BENCH NO. 2.

cleaning. A supplementary waste pipe is run in parallel, having three inlets made with 1 in. to ½ in. reducing sockets to carry water from condensers supported on the brackets.

Skeleton Benches

In addition to the above benches skeleton ones made from angle iron, but without tops, will be found very useful in Research and small Works Laboratories. Holes can be drilled along the edges at regular intervals and straps, drilled as necessary, can be bolted across to accommodate various pieces of plant such as small mills, presses, disintegrators, meat choppers, emulsifiers, etc., which may be driven by small motors attached to the bench. Pieces of board may be quickly placed across the bench, if desired, and removed at will. The absence of any top enables the products of various operations to be collected in vessels directly below the plant.

It might be thought that more attractive looking frames could be obtained by constructing them of pipework throughout. It will be appreciated, however, that the difference in the diameters of the pipes and their unions will give uneven services on which to place bench tops, or from which to hang brackets.

Japanese Society of Chemical Industry

AT the thirty-third annual general meeting of the Society of Chemical Industry in Japan, held in Tokio, it was reported that the number of papers communicated to the society during the year was 245, an increase of 48 on the previous year. The Society's medal for special merit in research was awarded to Dr. S. Urano for his valuable investigations on bleaching powder. This was followed by the presentation of 120 papers, covering almost all branches of chemical industry, and by four lectures on the paper, oxygen and rubber industries and on chemical warfare. The meeting ended with the visits to the Nippon Ford Motor Co., the Tsurumi works of the Tokyo Gas Co. (both in Yokohama) and the Tokyo Electric Co., in Kawasaki.

Fifty Years of Trade Journalism

Institute Luncheon to Sir Ernest Benn

SIR ERNEST BENN, chairman of Benn Brothers, Ltd., and Miss Betty Benn (in the absence abroad of her mother, Lady Benn) were entertained to luncheon at the Criterion Restaurant, London, on Tuesday, by the Trade, Technical and Scientific Branch of the London District of the Institute of Journalists, in order to mark the jubilee of Benn Brothers. Mr. Hugh B. Philpott, chairman of the branch, presided.

The Chairman proposed the toast of Sir Ernest Benn and Miss Benn, and, speaking of technical and trade journalists, said they could not count the circulations of their papers in millions, nor were they great at stunts. Theirs was the journalism of utility.

Forty Years Ago

Sir Ernest Benn said that he could go back forty years into those days when the firm possessed one letter book and a copying press. It was his duty to write the letters and do the copying. They were days before the arrival of the accountant and cost accountancy. Business accounts then, some of which were preserved to-day, showed nothing that would be recognised as accounts in these times. Estimates were "guesstimates," and the only costing system was the other man's catalogue. It was not quite respectable to advertise, and one thing was very clear—certainly in the furniture trade—that you must not illustrate anything you had for sale, because it would give away to your competitor the latest and newest design. The advertisements of those days, having set it out that the firm was wholesale and export only, that inquiries were respectfully solicited and that estimates were free, if they went any further than that, might contain an illustration of a building. There were no typewriters. It was upon the records that some anxiety was caused because he allowed an American drummer to leave one of those machines on a month's free trial. There were no telephones, nor motors, nor tubes, not even electricity as a commercial proposition, forty years ago, and no women in business.

Some Interesting Changes

Those were days before the arrival of all those extravagantics so strangely called economics. His father's first election circular in 1889 set it out that "He has had a thorough business training fully fitting him to deal with those economical interests which are most important to business men, who, like himself, have to pay heavy rates." He had searched and failed to find the figure, but he had the profit and loss account of 1881, in which they would find the staggering item of "rates: £3 10s.," and, "if you please," said Sir Ernest, "he went into public life to get rid of that intolerable burden!" Could they wonder that he sang with fervour the line in the old hymn, "Change and decay in all around I see"?

One of the earliest and oldest subscribers to the *Hardware Trade Journal* was very very proud of the fact that his grandfather had been in the same business, had been cursed by the Duke of Wellington, and told that he was a rascal who bowed lower and charged higher than any tradesman in the town. They would notice that in that way things had changed. There was no alteration in charging high, but there was very little of the bowing low in business to-day, which illustrated a point which he was fond of preaching—the way in which we had forgotten the customer and the consumer, thus bringing many of our economic ills upon us.

There was one way in which the world had not changed. Literary criticism was just as snobbish in those days as in these. The *Athenæum*, reviewing the first number of *The Cabinet Maker*, stated that it was "likely to be useful—not only to those who sell furniture, but to the men who make it. Although confined to its proper subject, it is by no means unreadable or devoid of culture and taste." His father, a modest man, actually published that bit of impertinence on the top of his billhead as a recommendation.

There was no net sales stunt. Journalism was a serious occupation, even outside the trade and technical Press. Indeed, he thought that the trade and technical section ought to recognise more definitely than they did the responsibilities that they carried, for they were almost the sole remaining depository of the old and best traditions of journalism.

Testing of Carbon Blacks for Rubber

By T. L. Garner

The following contribution deals with some methods of testing the chemical and physical properties of carbon blacks for use in the rubber industry before compounding in order to secure uniformity of product.

No decisive correlation has yet been found between the chemical and physical properties of carbon blacks and the mechanical properties of the rubbers in which they are incorporated, although one or two cases have been instanced where some chemical or physical property such as the adsorptive capacity[1], gives an idea as to the properties in rubber mixings. Nevertheless, it is desirable to make a thorough examination of carbon blacks before they reach the compounding room in order to preserve uniformity of product to as great an extent as possible.

Moisture and Volatile Matter

Carbon blacks afford an enormous surface for the absorption of moisture which under favourable conditions may reach a figure of 20 per cent., although no such amount is met with under normal conditions of storage. In the determination it is not satisfactory to use open dishes or crucibles since the carbon black rapidly absorbs moisture again on being taken from the drying oven, but flat weighing bottles should be used so that the powder can be spread in a comparatively thin layer on the bottom, and the stopper fitted immediately the bottle is removed from the oven. The latter should be maintained at a temperature of 110–120° C. and the time of heating should be carefully observed and rigorously standardised, since varying results will be obtained if the blacks are heated for varying periods. It is not, however, necessary to heat the powders in a U-tube in a current of dry hydrogen as has been suggested by some writers.

Carson[2] has suggested a different method for estimating the total moisture which is as follows: Five grammes of black are heated to 150–175° C. in an oil bath with 25–35 ccs. of dry Xylene and 200 ccs. of dry mineral oil. A short air condenser leads to the bottom of a 25 c.c. distillation flask to which are connected two or more calcium chloride tubes. A stream of dry nitrogen is passed through the apparatus, the water and Xylene being distilled into the small distillation flask and thence, by warming on a water-bath, into the drying tubes, the current of nitrogen being continued. Water is removed from the Xylene in a short time, indicated by the disappearance of cloudiness, and the tubes are then connected directly to the nitrogen line and gas passed through until constant weight is obtained.

Xylene is not absorbed by calcium chloride and nitrogen does not remove water from it at room temperatures during the time required for the experiment. A considerably higher amount of moisture is obtained in this test than in the usual "oven" test, indicating that the moisture is of the "bound" or "capilliary" type.

Dry storage, with reasonable circulation of air round the bags, will remove an excess of moisture from carbon black in about ten days, but the final state of the sample will depend upon the temperature and atmospheric humidity, for Johnson[3] has shown that the moisture of the black closely follows the changes of humidity in the air.

Determining Ash Value

The best method for determining the ash value of a carbon black is in an electric muffle furnace, flame combustion giving generally unsatisfactory results. The ash content is very low and a complete qualitative analysis has little value, except that copper and manganese should be absent on account of their well known ill-effects upon the ageing of rubber goods.

Acetone Extract

This can be satisfactorily carried out in a Sohxlet extractor using thick filter thimbles to prevent the carbon passing through, care being taken that no "creeping" occurs over the top; the extraction should continue for 24 hours. A marked difference is observed in this test between the gas and acetylene blacks and lamp black, the latter giving a much higher value, which is to be expected from the nature of its origin. Nevertheless, it may be mentioned that this difference is not apparent to such an extent if ethyl ether is used, and the latter in no case gives such high extracts owing to the lower effective temperature of extraction.

The above comprise all the chemical tests which need be applied as routine tests on blacks, but in certain cases it may be desirable to include the total sulphur, when the method due to Eschka will be found most convenient. One gramme of black mixed with 2 grammes of Eschka mixture (2 parts of light calcined magnesium oxide to one of anhydrous sodium carbonate) in a crucible and covered with a further one gramme of the mixture, is heated cautiously in an electric muffle, coal gas flames often containing sufficient sulphur to vitiate the results. After half an hour the crucible is heated to redness with stirring until all black particles have gone, when the fusion is extracted and sulphate estimated in the usual manner. The Carius method is not generally satisfactory.

The following table shows some average figures obtained in routine testing of blacks over several months:

	Ash Per cent.	Moisture Per cent.	Ac. Ex. Per cent.	(200 mesh) Grit Per cent.
Gas Black A.	0·29	2·94	0·319	0·155
,, ,, B.	0·18	3·10	0·310	0·062
,, ,, C.	0·00	0·132	0·910	0·00
Thermatomic Carbon	0·20	0·136	0·592	0·168
Vegetable Black A. ..	0·38	0·482	0·712	0·291
,, ,, B. ..	0·374	0·53	0·88	0·014

The grit test is the wet test, using the apparatus devised by Porritt and Gallie.

Colour and Covering Power

No general distinction in colour occurs between the various types of black, and lamp blacks will be found which are quite as jet in colour as gas blacks. The pigmentary properties can be observed by darkening 50 gms. of zinc oxide with the black and making up to a stiff paste with glycerine, the colour being examined through a sheet of glass on which the pastes are spread, the amounts giving the same shade as a standard, noted.

Other methods have been suggested from time to time and all are more or less unsatisfactory because of the human element. Recently Johnson[4] has suggested the use of an instrument called a Nigrometer for testing colour. In this instrument the reflected light from powerful lamps on to the specimen is visible as an elliptical field in the eyepiece. Round this field is a larger circular surface representing light transmitted from a standard source. The position of the latter source is used as a measure of the intensity of the black.

Specific Gravity

For this determination a 100 c.c. specific gravity bottle is desirable on account of the extreme bulk of the powder, and care should be taken to remove air by warming the flask containing powder and water on a water bath and then subjecting to reduced pressure in a vacuum desiccator. A method of avoiding this troublesome procedure, and sufficiently accurate for ordinary purposes, is to take the gravity of a standard rubber mixing containing a known amount of the black and to use this figure in comparison with other blacks.

Recently Carson and Sebrell[1] have examined the adsorptive capacity of various blacks and they conclude that this property is a measure of the rate of cure of the rubber mix, low-adsorptive blacks giving a faster curing stock than high-adsorptive blacks. The effect of temperatures of 500–1200° C. on carbon blacks is to render them highly adsorptive and also to give a rubber mix which cures faster, giving a higher modulus. An indication of the stiffening action of carbon blacks may be obtained by measuring the amount of carbon dispersed in a thin rubber cement which cannot be centrifuged out in a given time.

(1) Carson and Sebrell. "Some Observations on Carbon Blacks." I. & E.C., 21, 10, 911.
(2) Carson, I. & E.C. (An. Sect.), 1, 4, 225.
(3) Johnson, Rubber Age (N.Y.), February 25, 1928.
(4) Johnson, I.R.W. February 1, 1928, p. 65.

Steam and Power Plant at Billingham

A Remarkable Installation

THE elaborate and detailed paper before the Institution of Electrical Engineers by H. A. Humphrey, D. M. Buist, and J. W. Bansall, dealing with the new steam and power plant of Synthetic Ammonia and Nitrates, Ltd. (Imperial Chemical Industries, Ltd.), at Billingham-on-Tees, gives for the first time a comprehensive description of an industrial steam boiler and power installation equally striking as the River Rouge plant at the Ford Works, Detroit. It is extremely difficult to summarise the paper, which is condensed and packed with drawings, diagrams, and figures, but among the main features of the installation, as now completed, are a boiler plant operating at a maximum pressure of 800 lb. per square inch and 855° F. superheated steam temperature, fired with pulverised fuel on the latest principles, a huge distilling plant of about 2,500 metric tons (2,204 lb.) of distilled water per 24 hours capacity for the make-up water, seven-stage feed-water heating, high pressure turbines of special design, an elaborate system of automatic control of steam generation and frequency, and unusual layout features for the complicated network of pipes and cables.

The boiler plant has been designed and constructed by International Combustion, Ltd., and consists of eight very large forged drum boilers of the semi-vertical four-drum type, each with minimum operation of 215,000 lb. of water per hour and 700 lb. pressure and a maximum of 269,000 lb. and 800 lb., along with gill-tube steaming, economisers, air heaters, superheaters, and dust extractors. The normal duty is the enormous figure of 11,700 metric tons of water evaporated per 24 hours, constituting one of the largest steam plants in the United Kingdom, and the operation is by means of " Lopulco " pulverised fuel firing.

The equipment includes ten " Raymond " roller mills, each of 15 tons of coal per 24 hours capacity, while the air is preheated to 500° F. and the combustion chamber walls are built up of " Murray-Usco " fin tube walls. Each boiler is fired by four " R " type turbulent burners, totalling 16 tons of coal per boiler per hour capacity, while the forged steel drums (32 in all) are 43 ft. long, 4 ft. 6 in. internal diameter, and 4½ in. thick, weighing 56 tons, made from 150 steel ingots.

The whole of the steam passes to five turbines of 12,500 k.w. each, normally 630 lb. pressure and 833° F. at the stop valve, of which three are of the back-pressure single cylinder sixteen-stage type with cylinder and two steam chests of forged steel, while the other two are condensing units, partly stand-by. Normally about 60% of the total steam generated, that is 6,930 tons per 24 hours out of 11,700 tons, is required for process work, with 3,994 tons returned as condensed water, while electricity up to 43,500 kw. is also produced. These back pressure turbines exhaust at 290 lb. and about 650° F. to the ordinary process mains, which connect also to separate boiler plant. The whole installation is one of the most impressive examples of the importance of the back-pressure principle for many industries, over 70 in number, using low pressure process steam.

A Notable Bicentenary

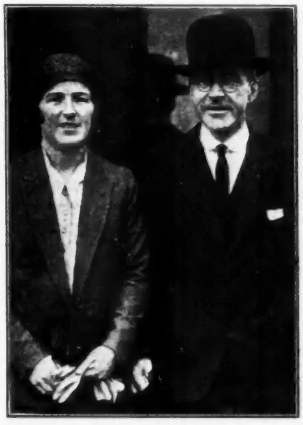
PREPARATIONS are now being made to celebrate the bicentenary of the firm of W. and T. Avery, Ltd., the well-known Birmingham manufacturers of weighing and testing appliances. The full programme of events has not yet been completed, but the commemoration will extend over several days at the beginning of July, and many people prominent in industrial, commercial and professional circles have already promised to attend.

The growth of the firm of Avery may be described as one of the romances of industry, and next month's celebrations will commemorate 200 years of successful progress. Originating in a small steelyardmaker's shop at No. 11, Digbeth, Birmingham, opened in 1730 by a Mr. Ford, the business has grown steadily until to-day the firm and its products are known throughout the world. The present range of output from the Soho foundry, acquired by the firm in 1897, includes heavy weighing and testing machines, commercial scales of all descriptions, liquid measures, testing apparatus for textiles, balances of the finest and most delicate accuracy for chemical and pharmaceutical uses, and the most modern types of scales for laboratory work.

The "John Benn" Ferry Boat

Relatives on Board at Maiden Trip

THE London County Council's new ferry boat, *John Benn*, made her maiden trip across the River Thames from the South Pontoon, Woolwich Free Ferry, on Friday, May 30. Many of the relatives of Sir John Benn, including the present baronet, Sir Ernest Benn, were present, and a party of boys from the John Benn Hostel in Stepney also made the journey. The vessel has been named after the late Sir John Benn, Bt., the former Chairman of the London County Council.



SIR ERNEST BENN WITH HIS DAUGHTER, MISS BETTY BENN, PHOTOGRAPHED ON BOARD.

Mr. F. Bertram Galer (Chairman of the Highways Committee of the London County Council) spoke on board on the inauguration of the increased service, and welcomed Sir Ernest Benn and Sir Henry Maybury, G.B.E. (Chairman of the London and Home Counties Traffic Advisory Committee), who briefly replied. Those present included grandchildren of Sir John, and Mrs. Wedgwood Benn (wife of the Secretary of State for India), and Mrs. C. E. Hughes. Other members of the London County Council present were Mr. E. H. Kemp (Vice-chairman of the Highways Committee, Mr. I. J. Hayward, Mr. Charles W. Matthews, Mr. John Speakman (members of the Highways Committee), Mr. Charles J. Allpass, Mr. M. Campbell-Johnston, Mr. A. McD. Gordon, Mr. Adrian C. Moreing, Dr. Adeline Roberts, Mr. E. J. Sainsbury, and Mr. Walter Reynolds.

Corrosion of Tin-Plate by Foodstuffs

AN interesting discovery made at the Low Temperature Research Station, Cambridge, is recorded in the annual report of the Empire Marketing Board. During an investigation of the corrosion of tinplate by foodstuffs it was found that, though certain sugars definitely increased the rate of corrosion, a sample of refined English beet sugar definitely retarded it. Samples of refined beet sugar from most of the English factories also exhibited this property, though in varying degrees. " The property," it is added, " seems to belong not to beet sugar itself, but to some unidentified substance present in the mother liquor. The economic interest of the discovery lies in the fact that there has been a tendency on the part of the canning industry to avoid beet sugar."

The breeding of beneficial parasites had been continued at the Parasite Laboratory, Farnham Royal, and now comprised about sixty species.

Annual Meeting of W. J. Bush and Co.

THE thirty-third annual meeting of W. J. Bush and Co., Ltd., was held on Monday in London, Mr. J. M. Bush (chairman) presiding. Comparison with the figures of the previous year, said the Chairman, showed a big fall in both gross and net profits, due partly to general trade depression and also to the practical failure of the clove crop, essential oil of cloves being one of their most important raw materials, used in the manufacture of vanillin. Both the subsidiary companies of America and Canada had made the biggest profits since their formation, but only dividends paid by these companies come into the parent company. The accounts showed exceptionally heavy expenditure in buildings and plant and they had devoted much money to building up a fine chemical industry in this country under the encouragement of the Safeguarding of Industries Act. The continuance of the Act was obviously of the utmost importance.

The accounts, showing a balance of £89,192 9s. 8d., and a recommended final dividend of 4 per cent., making 8 per cent. for the year, were adopted.

Unemployment and Work

By Sir Ernest J. P. Benn

Personal endeavour is the only instrument for curing unemployment, states Sir Ernest Benn in the sixth article of his series, in which he analyses the significance of political slogans. Previous articles of the series appeared in THE CHEMICAL AGE *of May 3, 10, 17, 24 and 31. The next, on "Trade Union Policy," will be published next week.*

VI—Political Poison

WHEN the intelligent person reads an advertisement, he generally brings all his critical faculties to play upon it. If the advertiser is at pains to explain the merits of, say, some brand of whisky, the reader will not usually take the statement at its face value, but will ask himself what else the advertiser might say, what are his limitations, and what is there to be said that he cannot say? For instance, the whisky advertiser would not be expected to discourse upon the dangers of over-indulgence in spirits; he is not likely to mention the health-giving qualities of cocoa or meat extract, neither will he be found explaining that there are better whiskies to be had at higher prices. The man is simply obliged to say that his particular whisky will suit you better than any other. All of which is understood, right and proper, as applied to advertising.

But when we listen to a political advertisement it seems as if we give our critical faculties a rest. We are told that there is an unemployment trouble and we must therefore alter the Empire, or adopt a big scheme of road repairs, or double the dole. We choose between these various suggestions, take the advertiser at his word, squander our money upon him, and preserve him immune from the healthy benefits of the sort of intellectual analysis that we always bestow upon the commercial advertiser. The difference is the more stupid and striking when we remember that the tradesman who falls below the quality of his own words loses his business and pays a natural penalty, while the politician runs no such risks.

Changes of Fashion

When we hear a politician say "I can conquer unemployment," we ought, merely as a matter of self-protection, to ask what else can the fellow say. We should remember that he has previously talked about Ireland, Disestablishment, non-provided schools, the House of Lords, land values and quite a number of other things, and would gladly go on talking about any of them but for the fact that political fashions have changed. We should also have in the back of our minds our politician's personal point of view. He cannot very well say "I want to be Prime Minister"; indeed he will generally pretend that he is reluctant to assume the burdens of office. Neither can he say "£400 a year in Westminster will suit me better than a minor trade union job in the country." He is equally debarred from explaining that having made a success of business he would like to become a public figure and perhaps get a knighthood, or that business at the bar being slack and barristers being unable to advertise, the letters "M.P." would be helpful in getting briefs. The would-be politician must take the political market as he finds it and talk the stuff that leaders have put upon the programme. No other course is open to him. To-day it must be unemployment, to-morrow it will be India, and after that probably Russia, and, in a couple of years' time, when there are three million dole-drawers we shall hear no more about unemployment than we do to-day about housing or temperance reform. One day he must explain that the Coal Bill is the work of the devil, and a week later from the same platform he must tell us that he has changed his mind in the interest of peace.

Such is politics. Imagine the plight of all three parties if unemployment disappeared. In the meantime, however, the effect of the activities of our politicians upon the psychology of a newly enfranchised proletariat is something more than merely dangerous, it is highly demoralising. Every party in the political field is explaining to people on whose personal efforts the continuance of civilisation depends that they need do nothing, that as individuals they are the helpless victims of somebody else's mistakes, and that the State and the Government will put matters right. All the details of unemployment and insurance fade into insignificance beside this one great big political lie, repeated with varying emphasis by every party. Instead of making our citizens to feel that each of them has his share of responsibility for the State, we have developed a whole generation of pauper-minded people; for a millionaire after a tariff or a subsidy is as much of a pauper as the servant girl who finds it easier to call for the dole at eleven than to light the kitchen fire at seven thirty.

Contrast with America

Unemployment will never be cured by politics. It is a disease which is only susceptible to the purge of personal endeavour. Most of the other nations of the world understand this; we are alone in our marked preference for politics to the facts of life. America provides the most striking contrast with ourselves, a contrast which can be emphasised by summarising the public opinion of the two countries. On this question the public opinions of England and America are exact opposites. John Bull is day by day chanting to his children some such story as this:—

"You are a good fellow; do the best you can. Don't kill yourself at it. You were not made for work. A happy life is what you came here for. If you find things too hard for you, there is an insurance fund and a dole and an old age pension at your service. If at all times our arrangements for your well-being and comfort do not in every way meet with your approval you can rely upon the Government or the Universities or the Trade Unions, or some other highly intellectual bodies or persons, to devise new ministries or new legislation for your perfect comfort."

While Uncle Sam may be heard through every responsible utterance in America to be preaching the opposite theories. Here are his words:—

"You are a man. You are as good as any other man. Anything which any other man can do, you can do, if you will try. Life is not a bed of roses; it's a struggle with the forces of nature. The world depends upon work, effort, endeavour on your part and on the part of everybody else. If you succeed, you help to lift others up; if you fail, you help to push others down. So get out and get on and be quick about it. Above all, remember that America is destined to lead mankind and that you are an American citizen."

While we in this country seem determined to encourage our people to lean, America is concerned to maintain in the breast of each of her citizens the spirit of push, and the difference is very serious—for us.

If there is even an element of truth behind this general sketch it would appear to be hardly worth while to discuss the details of the present-day situation. With a heart and mind which are all wrong other things are of no account. It becomes easier to understand the monstrosity of a Conservative Party which is Socialist to the core. Some people seem to imagine that Socialism means giving something to the workers, and they call themselves anti-Socialists because they are in favour of robbing the State in the supposed interests of other classes. They have not the brains to see that Socialism is a principle which embodies two deadly errors—the first, that producers should be considered before consumers, and, secondly, that the State is more important than the citizen. Any man who is guilty of the suggestion that political action can take the place of constructive individual work is a Socialist, and when he calls himself a Conservative he is a much greater danger than when he speaks under the shadow of the Red Flag.

The State Idea

We have drifted into a degraded political auction simply because we have all become infected with the malaria of the State idea. All parties tell us that a few more Acts of Parliament and a few more forms and officials will do the trick.

When I walk down the Strand and see a big notice on a derelict shop "Sale now proceeding: PREMISES COMING DOWN" I get, or so it seems to me, a perfect picture of our political situation. The auctioneer is appealing to the ignorant with worthless, gaudy imitations, but not quite so worthless as the benefits displayed a little further on at Westminster. He does at least deliver some sort of a clock, even if the gilt is spurious and the works unreliable, while at Westminster

all one gets is a form of dope which does exactly the opposite of what the label claims. Some reader may perchance regard this statement as too sweeping, and the sincere believer in some new kind of social legislation may look upon it as unkind and cynical. But I am relieved of the necessity of arguing the matter by the fact that, whatever the particular economic blessing offered by one party, two other parties full of experts will expose its dangers for me.

Wealth cannot be made from votes, and it is wealth we want. Wealth requires producers, and politics multiplies the non-producers. We must separate our politics and our economics; they are getting into a disastrous muddle. All our politicians talk about economics without, for the most part, the faintest conception of what the word means, and on the other hand some of our economists are becoming politicians, hoping thereby to be able to leave the secluded quiet and poverty of a scientific life for the delights of big business and bank directorships.

Barriers Between Man and Job

Meantime, all of them are multiplying the non-producers and building up the burdens upon genuine industry. We have suffered in the past from landlords and profiteers, but none of these parasites ever secured for himself so large a share of the products of real work as our new masters. They get in between a man and his job and erect such barriers as to make the job itself easy by comparison with the work of getting at it. Money is their medium—other people's money. It will not be long, however, before even the poor understand that we cannot cure poverty with money. The distribution of the pieces of paper that we call money, whether by taxation, pensions, doles, fiscal arrangements or other allowances and devices may move wealth about, but it cannot make wealth, it adds nothing to the possessions of society considered as a whole. It is some years since Professor Bowley exposed the folly of the dividing-up idea, and yet our politicians continue to pretend that there is something in it. The best that we can hope is that another subject may some day soon attract their attention, and then men and women whose personal force and qualities are the only real assets we possess will quickly resume the beneficent processes of improving the standard of life for all of us.

German Glass Technologists

Visit to Greenford Factory

ABOUT seventy members of the Deutsche Glastechnische Gesellschaft (the German Society of Glass Technology), who are in this country as guests of the British Society of Glass Technology, paid a visit to the Greenford factory of the Rockware Syndicate, Ltd. (the manufacturers of London's milk bottles), on Friday, May 30, and saw the production of milk bottles, medicine bottles and potted meat jars from begining to end. The visit was part of the itinerary preliminary to the London convention of Glass Technologists. A point that raised a good deal of interest was the brilliant finish on the bottles, which are all of white flint glass, as they emerged from the annealing lehrs, which are of a special type. This, it was explained, was due in part to the fact that, in course of anneaing, combustion gases for heating the lehrs did not come into contact with the glass, as happened in some old-fashioned types of lehrs.

Visitor's Tribute

Another detail in the Rockware process that excited comment was the process of applying coloured lettering to bottles, in which the letters are baked into the substance of the glass. The factory produces 150,000 milk bottles and about 200,000 other types of bottle per week. After inspecting the works, the visitors were entertained to lunch, and Mr. W. A. Bailey (a director of the firm) expressed a hope that they had seen something to interest them in their visit. Mr. Ruehle, a director of the glass works at Gerresheim, who replied, said that of all the factories they had visited they had not seen one so well equipped with automatic machinery and so efficiently organised as the Rockware factory, nor one where so much attention was paid to the cleanliness and to the uniform quality of the products.

The visiting party was led by Dr. Gehloff (vice-president of the German Society and a director of the German Osram Lamp Co.).

Brunner Mond Shares

Application for Compulsory Acquirement Adjourned

IN the Chancery Division on Wednesday, Mr. Justice Clauson had before him an application by Imperial Chemical Industries, Ltd., for leave to acquire certain shares in Brunner Mond and Co. compulsorily.

Mr. Cohen, K.C. for I.C.I., said the capital of Brunner Mond and Co. was £15,000,000, divided into ordinary and preference shares. In 1926 I.C.I. was formed to amalgamate Brunner Mond and Co., Nobel Industries, the United Alkali Co., and the British Dyestuffs Corporation. The original capital was £65,000,000, divided into preference, ordinary and deferred shares. The capital of I.C.I. was now £95,000,000. In December, 1926, a circular was issued to the shareholders in Brunner Mond and Co. offering in exchange of four preference shares to give them five in the transferee company, and for every two ordinary shares in Brunner Mond and Co. three I.C.I. ordinary shares and two deferred shares. Now I.C.I. were willing to purchase the shares in cash, but on the basis of the true value of the preference and ordinary shares in Brunner Mond and Co. I.C.I. suggested that the price the Court should fix in cash for preference shares in Brunner Mond and Co. was 27s. each, and for the ordinary shares 35s. He understood that I.C.I. would be willing to give the Brunner Mond shareholders shares in exchange, as set out in the petition.

His lordship: Do you offer cash or shares?

Mr. Cohen: Yes; and if they take the cash we say what we offer is the real value of the Brunner Mond shares.

Mr. Vaisey, K.C., said he appeared for 800 ordinary shareholders out of the outstanding 4,631. His submission was that the offer in cash was not a sufficient offer.

His lordship: Is the price offered a price greater than is required to buy the shares in I.C.I.?

Mr. Vaisey: Much less.

Mr. Cohen argued that the price fixed by the Court should be on the basis of the market value of the Brunner Mond shares. On that basis, he submitted that the offer was a fair one. It had been suggested that the shares in Brunner Mond had appreciated, but his submission was that they had depreciated.

Mr. Vaisey said his submission was that the value of each of his ordinary shares was 43s. each, and he based that on the offer of I.C.I. on exchange of shares. He was not prepared to take the offer made.

Mr. Hart, for the preference shareholders, argued that the offer was not a requisite one having regard to the value of the concern.

Mr. Vaisey read a number of affidavits by shareholders stating that they had been offered as much as £3 4s. per share.

Mr. Cohn said his offer was £2 3s. per share cash.

Mr. Vaisey said he could not accept that as his clients thought 63s. 7d. should be the price.

Mr. Hart, for the preference shareholders, argued he should have 34s. a share, which would give him the same income for his money that he now got from the Brunner Mond shares.

His lordship: I had in mind 32s. a share.

Mr. Hart: I submit that is not enough.

Counsel had not concluded his remarks when the further hearing was adjourned.

British Acetate Silk Corporation

WHEN the petition for the winding-up of the British Acetate Silk Corporation, Ltd., presented by Johnson and Phillips, Ltd., as judgment creditors, came before Mr. Justice Eve, in the Chancery Division, on Monday, counsel for the petitioners said a receiver had been appointed on behalf of the debenture holders, and a scheme of arrangement had been prepared. The company had agreed to pay the petitioners' costs out of the first moneys available and, subject to that being done, he was instructed to ask that the petition be dismissed.

Mr. Gedge, who said he appeared for 200 creditors for over £100,000, who opposed the petition, stated that the scheme was not one of arrangement but for raising further finance.

Mr. Justice Eve made no order on the petition.

From Week to Week

THE ALBERT MEDAL of the Royal Society of Arts for the current year has been awarded to Professor Henry E. Armstrong, F.R.S., for his discoveries in chemistry and his services to education.

DR. A. J. V. UNDERWOOD, who has resigned his position as managing director of the Anglo-Yugoslavian Wood Distillation Co., Ltd., has accepted an important appointment with the Distillers Co., Ltd.

BELGIAN EXPORTS of basic slag in 1929 totalled 1,225,000 tons, there being an increase in the sales to Holland and Poland, but a decline in those to the United Kingdom, Germany and Norway.

AN ESCAPE OF AMMONIA at the ice factory of William McClachlan and Co., Logan Street, Glasgow, led to six workmen being gassed on Tuesday. Three of them had to be taken to the Victoria Infirmary, where they recovered after treatment.

DR. BOSCH, managing director of I.G. Farbenindustrie, speaking at the ordinary general meeting, declared that, as the result of the policy of rationalisation being followed by the company, about 1,600 workers were being discharged monthly. The company has now 98,000 employees.

LORD MELCHETT, the chairman of Imperial Chemical Industries, Ltd., will receive the Prince of Wales on his visit to Middlesbrough on July 2, when he will inspect the works of Synthetic Ammonia and Nitrates, Ltd. It is likely that the Prince will open the new sports pavilion at Billingham.

THE SUMMER CONVENTION of the National Lubricating Oil and Grease Federation was held in Cardiff last week, when the delegates were accorded a civic reception by the Lord Mayor (Alderman William Charles). During the week a visit was paid to the Anglo-Persian Oil Company's refining plant at Llandovery, Swansea.

DR. FREDERICK N. KERR, chemist at the new Triplex glass works at St. Helens, who was badly scalded in an accident at the works on May 21, succumbed to his injuries in hospital on Monday. He was 25 years of age, and had obtained a first-class honours degree at Cambridge. Before joining Triplex Northern, Ltd., in September last, he had been engaged in research work at Munich, and his career was regarded as full of promise.

THE TIN PRODUCERS' ASSOCIATION has appointed a special committee to deal with the regulation of output throughout the world, and the following have accepted office: Messrs. F. J. Houwert and J. Van Den Broek, of Billiton, Dutch East Indies; Messrs. F. E. Mair and C. V. Stephens, representing Tin Producers' Association (Malayan section); Messrs. Antenor Patino and Martinz Vargae, representing Tin Producers' Association (Nigerian section). The special committee held its first session in London, when complete agreement was reached on all points.

THE KING'S BIRTHDAY HONOURS list includes the following:—*Knights:* Major Thomas Henry Crozier, Chief Inspector of Explosives, Home Office; Mr. Francis William Goodenough, chairman of the British Commercial Gas Association; Mr. Herbert Wright, chairman of the Executive Committee of the Governing Body, Imperial College of Science, South Kensington. *C.B.E.:* Dr. Ernest Woodhouse, honorary technical adviser to the Area Gas Supply Committee, Board of Trade. *O.B.E.:* Dr. Frank Bennett Young, Principal Scientific Officer, Admiralty Research Laboratory. *M.B.E.,* Mr. John Haworth, Chief Chemist and Water Examiner, Sheffield Corporation.

UNIVERSITY NEWS.—*London:* The following degrees have been awarded: Ph.D. (Internal) Chemical Technology, A. S. Fitzpatrick, Imp. Coll., Royal College of Science; Ph.D. (External) Chemistry, A. Kershaw, Huddersfield Technical College. *Edinburgh:* Sir F. G. Hopkins, F.R.S., has been reappointed External Examiner in Biochemistry for 1930 and 1931. *Durham.*—Arthur Elliott has been recommended for the degree of Ph.D., his thesis being "I. The Nature of the Activating Radiation in the Photo-Chemical Union of Hydrogen and Chlorine. II. The Absorption Spectrum of Chlorine." *Liverpool.*—The honorary degree of D.Sc. was on Thursday conferred on Dr. George Barger, Professor of Chemistry in Relation to Medicine, University of Edinburgh.

OVER A THOUSAND members and guests of the Institution of Gas Engineers have this week been attending the annual conference in Leeds, the gathering being a record numerically.

INCREASED OUTPUT has made it necessary for the Chemical and Insulation Co., Ltd., of Favordale, near Darlington, to extend their entire works and plant, and some sixty acres of land has been acquired for the purpose.

DR. L. F. GOODWIN, Professor of Chemical Engineering at Queen's University, Kingston, Canada (and brother of Captain C. J. Goodwin), has been elected on the chemical engineering education committee of the British Institution of Chemical Engineers.

MR. J. G. PEARSE, director of the British Cast Iron Research Association, on his way home from the British Foundrymen's convention at Cleveland, gave an address, under the auspices of the Ontario Research Foundation, on "Cast Iron in the Light of Modern Research."

LEVER HOUSE, Victoria Embankment, London, has been sold by the governors of Bridewell Hospital for £250,000, and on the site Lever Brothers, the present tenants, are to build extensive new premises, which will form the central offices of the Unilever concern, formed by the fusion of interests between Lever Brothers and the Margarine Union.

RECENT WILLS include: Lord Dewar, estate proved at £5,000,000 "so far as can be at present ascertained"; Mr. James Cronshey, of Thetford, Norfolk, maltster and manure manufacturer (net personalty £10,354), £17,052; Mr. George Reveley, Southport and Manchester, late of the British Dyewood Co., Ltd. (net personalty £6,050), £6,381.

MR. SAUL G. BRON, the Soviet Union trade representative, on Monday gave an account of the industrial and agricultural development of Russia to the Manchester Chamber of Commerce. During a few recent weeks, he said, while he was in Moscow, the first big order for fertilisers, amounting to about a quarter of a million pounds worth, was put through with Imperial Chemical Industries.

A BILL for the grant to Imperial Chemical Industries, Ltd., as from May 22, of a two-year option on Moscheto Island, Newcastle (New South Wales), to enable the company to investigate the possibility of large chemical operations, has been introduced by the State Government. If the option is exercised, the company undertakes to spend £100,000 in the first two years and £400,000 in the following three years.

LORD BROTHERTON, who some time ago gave £100,000 to Leeds University Building Scheme, is expected to make an important announcement when he lays the foundation stone of the new library building on June 24. It is understood to be his wish that his own library, one of the finest collections in the country, should be housed in this building and made available for the nation through the medium of the University. It is also expected that Lord Brotherton will make a further grant of £30,000 towards the administration of the library.

THE NATIONAL RESEARCH COUNCIL OF CANADA announces a number of staff changes. Dr. R. H. F. Manske has been appointed associate research chemist; Dr. D. F. Steadman (who spent two years in research work in London under Professor Donnan) and Dr. C. Y. Hopkins, assistant research chemists; Mr. J. J. Green (a graduate of the Royal College of Science, London), junior research chemist; and Mr. S. J. Cook, chief of the Mining, Metallurgical and Chemical Branch of the Bureau of Statistics, general secretary of the Pacific Science Congress, which meets in Canada in 1932.

AT A MEETING in Brussels of the Société Technique et Chimique de Sucrerie de Belgique, Mr. Teatini, formerly professor at Liége University, who has been for some years manager of a large group of beet sugar factories in Belgium, explained for the first time a new process which he has invented for the purification of beet sugar juices, whereby the lime is reduced to about 0·5 per cent., resulting in various savings, amounting from 2s. 6d. to 3s. per ton of beet. The process has been employed in one of the largest Belgian sugar factories since 1928, and is expected to be widely adopted.

Obituary

MR. WILLIAM SPROULL, Heaton Chapel, Stockport, formerly chief chemist to F. C. Calvert and Co., Bradford (a post in which he succeeded his father), aged 53.

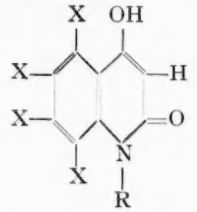
Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

327,380. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 1, 1928.

An *o*-hydroxy-diazo compound is coupled with a 4-hydroxy-quinolone having the formula



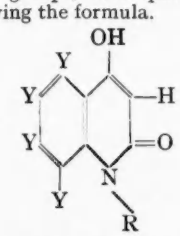
in which R represents alkyl, aralkyl or a cyclic radicle which may be substituted, and X represents hydrogen or any substituent, the components being chosen so that the product contains at least one sulphonic group. The products are azo dyes which may be used as mordant dyes, may be afterchromed, and may be converted into complex metal compounds. The dyestuffs referred to include 4-chlor-2-aminophenol 6-sulphonic acid → N-phenyl-4-hydroxy-2-quinolone, 4-nitro-2-aminophenol-6-sulphonic acid → N-ethyl-4-hydroxy-2-quinolone, diazotised picramic acid → Bz-sulphonic-N-methyl-4-hydroxy-2-quinolone, diazotised 1-amino-2-naphthol-4-sulphonic acid → N-methyl-4-hydroxy-2-quinolone, and 4-chlor-2-aminophenol-6-sulphonic acid → N-(2¹-methoxy-phenyl)-4-hydroxy-2-quinolone. Chromium compounds of some of these are described.

327,382. CONDENSATION OF ORGANIC COMPOUNDS WITH OLEFINES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 28, 1928.

Olefinic compounds are condensed with aromatic or hydrogenated aromatic hydrocarbons or derivatives, or aliphatic saturated compounds, in the presence of a catalyst containing a meta- or pyrophosphate, -borate or -arsenate of di- or trivalent metals such as zinc, chromium, manganese, or earth metals such as cerium and aluminium, *e.g.*, cerium meta-phosphate, cerium aluminium meta-phosphate, chromium meta-phosphate, cerium metaborate, and aluminium meta- or pyro-arsenate. The reaction is effected at 200°-500° C. and pressure above atmospheric. Examples are given of the condensation of naphthalene and ethylene, toluene and butylene, deca-hydro-naphthalene and ethylene, styrene and naphthalene, the products being very viscous lubricating oils. Other examples include the condensation of aniline and ethylene, monochlorbenzene and ethylene, phenol and ethylene.

327,394. DYEING CELLULOSE ESTERS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 1, 1928.

Azo dyestuffs suitable for dyeing and printing cellulose acetate are obtained by coupling diazo compounds derived from benzene, its homologues and derivatives free from sulphonic and carboxylic acid groups, with quinolones also free from these groups and having the formula.



in which R represents an alkyl radicle which may be substituted and Y represents hydrogen or a substituent. Examples are given.

327,393. SOAPS. A. L. Mond, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 1, 1929.

The usual soaps or soap ingredients are mixed with unesterified monoalkyl ethers of glycols or poly-glycols, with or without liquid hydrocarbons which may be halogen substituted, to obtain products of great solvent and detergent powers. The ethers may be mono-butyl, -ethyl and -methyl ethers of ethylene-, propylene-, or butylene-glycol, or of di- or tri-ethylene glycol. Other solvents include benzene, toluene, tetrahydro-naphthalene, carbon tetrachloride, and chlorinated aliphatic or aromatic, or hydro-aromatic hydro-carbons. Examples are given.

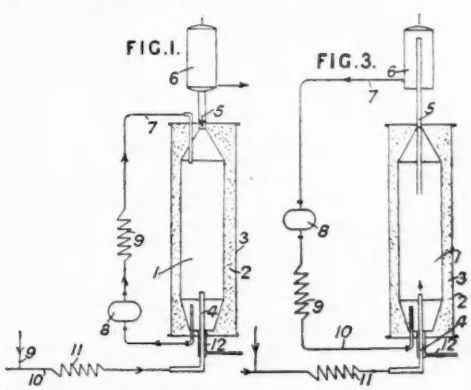
327,411. CONDENSATION REACTIONS WITH NON-AROMATIC HYDROCARBONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 27, 1928.

Non-aromatic hydrocarbons are condensed with hydrocarbons containing a halogen, ester, or ether group in the presence of an anhydrous metal halide such as aluminium chloride at a pressure between 2 and 100 atmospheres depending on the temperature. Examples are given of the condensation of petroleum with phosgene to obtain ketones of the aliphatic or cyclo-aliphatic series, hexane with acetyl chloride to obtain a product containing octanone, hexane with ethyl chloride to obtain octane, ethylene with methyl chloride, hexane with benzoyl chloride, and cyclohexane with acetyl chloride. The products are oily liquids.

327,421. TREATING HYDROCARBONS. Anglo-Persian Oil Co., Ltd., Britannic House, Finsbury Circus, London, and A. E. Dunstan, Meadhurst, Cadbury Road, Sunbury on Thames. Application date, October 4, 1928.

Petroleum oils are cracked in the vapour phase and the hydrocarbon vapour is treated to polymerise the gum-forming constituents by passing it at a temperature above 200° C. through a filter containing pumice, coke, bauxite, etc., saturated with zinc chloride solution. The vapour may then be passed through a jacket surrounding the filter, or superheated steam may be passed through the jacket. The filter may be washed with a solvent for the polymers, *e.g.*, the cracked spirit or gas oil.

327,443. DESTRUCTIVE HYDROGENATION. W. R. Tate and H. P. Stephenson, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, December 31, 1928.



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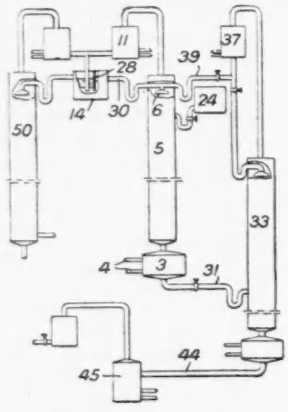
Carbonaceous material and hydrogen are passed through pre-heater 11 and pipe 4 into a converter 1 for destructive hydrogenation, and the temperature is controlled by circulating them through a heater 9 and pump 8. The residues are drawn off at 12. Liquid collecting in a vessel 6 may in a modification be recirculated through pump 8 and heater 9.

D

327,444. ACETIC ACID. Kodak, Ltd., Kingsway, London. From Eastman Kodak Co., 343, State Street, Rochester, N.Y., U.S.A. Application date, January 3, 1929.

Dilute acetic acid is fed from a storage tank 24 to a fractionating column 25, and ethylene dichloride is sprayed through



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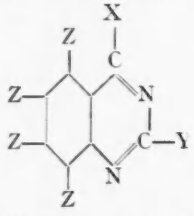
nozzle 26. The column 5 is heated by coil 4 in a vessel 3, and an azeotropic mixture of water and ethylene dichloride is distilled off to condenser 11. The mixture separates out in two layers in a tank 14 having a depending baffle 28 under which the ethylene dichloride passes to pipe 30 leading back to the nozzle. The upper layer of water with a little ethylene dichloride is heated with steam in a column 50 to recover the ethylene dichloride. The residual solution of acetic acid and ethylene dichloride passes by pipe 31 to column 33 in which ethylene dichloride is distilled off, passes to a condenser 37, and is returned to the cycle. Concentrated acetic acid is drawn off through pipe 34 to still 45 for further purification.

327,450. DYE INTERMEDIATES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 4, 1929.

Intermediates for dyes and pharmaceutical products, and insecticides are obtained by treating a Bz-nitromonohydroxyquinazoline with a phosphorus halide. The products are Bz-nitromono-halogen-quinazolines of the general formula



where *z* represents hydrogen or substituents at least one of which is a nitro group, either X or Y represents a replaceable halogen atom and the other represents hydrogen or a hydrocarbon residue. Examples are given of the preparation of 6-nitro-4-chloroquinazoline, 7-nitro-4-chloroquinazoline, 6-nitro-4-chloro-7-methylquinazoline, and 7-nitro-4-chloro-2-phenylquinazoline. Examples are also given of the manufacture of the starting materials, 7-nitro-4-hydroxy-quinazoline and similar compounds.

327,463. PURIFYING MINERAL OILS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 6, 1928. Addition to 300,900.

Hydrocarbon oils of boiling point range corresponding to benzines, lubricating oils, motor oils, etc., are purified by treating them in liquid phase with hydrogen at pressures above 10 atmospheres and temperatures above 300° C. in the presence of non-ferrous catalysts which are immune to sulphur poisoning. Catalysts containing molybdenum, chromium, or tungsten are particularly suitable. The products of destructive hydrogenation may be divided into constituents rich in hydrogen and constituents poor in hydrogen by means of sulphur dioxide, and the constituents poor in hydrogen may be treated by the above process to obtain an oil suitable for Diesel engines. Crude lubricating oil obtained by fractional distillation of brown coal low temperature carbonisation tar is treated with hydrogen at 400° C. and 200 atmospheres pressure in the presence of a catalyst consisting of zinc oxide magnesia, and molybdic acid. Other examples are given.

327,481. DEHYDRATION. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, and W. Biltz, Hanover, Germany. Application date, January 17, 1929.

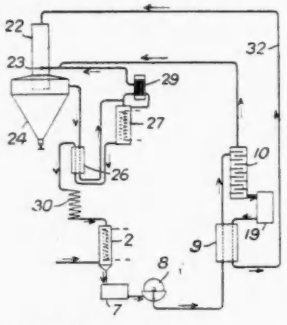
Metal oxides, silica, or other hydrogels are dehydrated by treating first with gaseous ammonia to saturate the contained water, which is withdrawn by suction, and then with liquid ammonia.

327,482. DEHYDRATING SALTS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 17, 1929. Addition to 327,481.

The process described in specification 327,481 above is applied to salts of alkali or alkaline earth metals or magnesium containing water as hydrate or as water of crystallisation, or as adherent water. In some cases, *e.g.*, crystallised magnesium chloride, double compounds are formed, *e.g.*, $MgCl_2(NH_3)_6$, which may be subsequently decomposed by heating to obtain the anhydrous salt.

327,488. AMMONIUM SULPHATE. O. Piette, 100, Avenue de la Toison d'Or, Brussels. Application date, January 25, 1929.

A cold, nearly saturated solution of ammonium sulphate is circulated and treated with ammonia to precipitate solid



327,488

ammonium sulphate, and the ammonia is recovered by heating. The liquor is treated with carbon dioxide and ammonia to form ammonium carbonate, and then with calcium sulphate to enrich the solution with ammonium sulphate. Ammonia is admitted at 23 to treat ammonium sulphate solution in a vessel 22, and solid ammonium sulphate collects in a vessel 24. The liquor passes through heat-exchanger 26, still 27, and cooler 30 to a column 2 into which carbon dioxide is admitted. The liquor passes to a vessel 7, where calcium sulphate is added, calcium carbonate is removed in a filter 8, and the solution passes to heat-exchanger 9, still 10, evaporator 19, and pipe 32 back to the vessel 22.

327,526. DYE INTERMEDIATES. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 27, 1929.

A benzanthrone unsubstituted in the Bz-1-position is condensed with a substituted or unsubstituted benzyl halide in the presence of a diluent and a hydrogen-halide-eliminating catalyst, or with a *p*-substituted benzyl alcohol in presence of an agent promoting the elimination of water. Examples are given of the condensation of benzanthrone and benzyl chloride, *p*-nitrobenzyl alcohol and 3-nitro-4-methoxybenzyl chloride and the condensation of 4:8-dichloro-benzanthrone and benzyl chloride.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 299,896 (G. F. Uhde), relating to conversion of ammonia into fertilisers, see Vol. XX, p. 31; 303,375 (I.G. Farbenindustrie Akt.-Ges.), relating to products of the anthracene series, see Vol. XX, p. 234; 305,174 (I.G. Farbenindustrie Akt.-Ges.), relating to monoazo dyestuffs, see Vol. XX, p. 340; 305,489 (I.G. Farbenindustrie Akt.-Ges.), relating to vat

dyestuffs and intermediates of the anthraquinone series, see Vol. XX, p. 360; 306,450 (Deutsche Gold-und Silber-Scheideanstalt vorm. Roessler), relating to N-substituted cyano-formarylides, see Vol. XX, p. 412; 310,536 (C. Still), relating to recovery of neutral ammonium sulphate, see Vol, XX, p. 621.

Specifications Accepted with Date of Application

304,145. Coal distillation gas, Purification of. Gewerkschaft M. Stinnes. January 14, 1928.

306,141. Cast iron containing little gas or oxides, Production of. C. Brackelsberg. February 16, 1928.

306,414. Hydrogenated amines, Manufacture of. I.G. Farbenindustrie Akt. Ges. February 18, 1928.

306,415. Azo-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 18, 1929.

307,840. Exothermic catalytic reactions, Devices for carrying out. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. March 14, 1928.

307,926. Nitrogen-containing derivatives of the benzanthrone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 16, 1928.

312,169. Mixed fertilisers, Production of. F. Jost. May 21, 1928. Addition to 306,046.

314,448. α-para-hydroxy-phenyl-β-methylamine propanol, Preparation of. I.G. Farbenindustrie Akt.-Ges. June 27, 1928.

315,854. Catalytic oxidation of organic compounds. Selden Co. July 21, 1928.

316,605. Simultaneous production of precipitated dicalcium phosphate and nitrates. F. C. Palazzo and F. Palazzo. August 1, 1928.

316,664. Mixtures of nitrate of ammonia and nitrate of lime. Appareils et Evaporateurs Kestner. August 2, 1928.

316,888. Separating acetylene from mixtures of gases, Process for. Soc. of Chemical Industry in Basle. August 4, 1928.

329,308. Electrolytic processes and baths therefor. M. Schlotter. February 14, 1929.

329,324. Electrolytic deposition of heavy metals. M. Schlotter. November 9, 1928.

329,326. Valuable salt mixtures suitable for use as fertilisers containing carbonates or conversion products of carbonates. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 15, 1929.

329,331. Refined products from carbonaceous materials such as coal, tars, mineral oils, etc. Recovery of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 12, 1928.

329,357. Derivatives of pyranthrone, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 17, 1928.

329,361. Non-corrodible metal. W. Haddon and J. Winfield. January 16, 1929.

329,364. Vat dyestuffs, Manufacture of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*) January 19, 1929.

329,375 and 329,389. Pure benzoic acid, Production of. I.G. Farbenindustrie Akt.-Ges. February 18, 1929. Addition to 307,343.

329,396. Butadiene, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 22, 1929.

329,427. Nitric acid, Production of. Hercules Powder Co. January 28, 1929.

329,456. Vulcanisation of rubber and the like. Imperial Chemical Industries, Ltd., S. Coffey, W. J. S. Naunton, and A. Shepherdson. April 4, 1929.

329,543. Separation of iron from solutions containing cobalt and rich in iron, such as those obtained by lixiviating roasted pyrites. H. E. Potts. (*Orkla Grube-Aktiebolag.*) June 18, 1929.

329,551. Gaseous exothermal Catalyses. Union Chimique Belge Soc. Anon. November 13, 1928.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Bakelite Ges. Combination of hardenable phenol-aldehyde condensation products with wood-oil. 16,814. May 30. (Germany, May 31, 1929.)

Boot's Pure Drug Co., Ltd., and Marshall, J. Hydrogenation of aromatic compounds. 16,462. May 28.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of complex salts of organic compounds. 16,356. May 27.

—— Electrolytic manufacture of gaseous fluorine. 16,357. May 27.

—— Treatment of vegetable and animal materials. 16,358. May 27.

—— Manufacture of rubber-like masses. 16,671. May 29.

—— Manufacture of rubber like masses. 16,800, 16801. May 30.

—— Manufacture of iodomethane sulphonic acid, etc. 16,901. May 31.

—— Manufacture of nitrogenous vat dyestuffs. 16,902. May 31.

Geigy Soc. Anon., J. R. Manufacture of monoazo-dyestuffs. 16,200. May 26. (France, May 25, 1929.)

Greenstreet, C. J. Distillation of materials containing hydrocarbons. 16,722. May 30.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of acid wool dyestuffs. 16,311. May 27.

—— Manufacture of acid wool dyestuffs. 16,490. May 28.

—— Manufacture of acid wool dyestuffs. 16,637. May 29.

Hodsman, H. J., and Taylor, A. Manufacture of sulphate of ammonia. 16,681. May 30.

Hoesch and Co. Improving caustic soda solutions. 16,378. May 27. (Germany, May 28, 1929.)

Horsley, G. F. Production of aromatic amines. 16,299. May 27.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Heat transferers for high temperatures. 16,160. May 26.

—— Purification of anhydrous aluminium chloride containing iron. 16,161. May 26.

—— Manufacture of lubricating oils. 16,484. May 28.

—— Manufacture of lubricating-oils. 16,626. May 29.

—— Impregnation of textile materials, etc. 16,627. May 29.

—— Manufacture of resistant porous sheets. 16,628. May 29. (January 24, 1929.)

—— Manufacture of rubber-like masses. 16,671. May 29.

—— Manufacture of mixed fertilisers. 16,767. May 30.

—— Apparatus for withdrawal of solid materials from high-pressure chambers. 16,768. May 30.

—— Manufacture of carboxylic acids from nitriles. 16,769. May 30. (December 18, 1929.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of quinoline and acridine compounds. 16,639. May 29. (Germany, June 10, 1929.)

—— Manufacture of wool dyestuffs. 16,783. May 30. (Germany, August 17, 1929.)

Imperial Chemical Industries, Ltd. Firing rotary cement kilns. etc. 16151. May 26.

—— Production o; aromatic amines. 16299. May 27.

Imperial Chemical Industries, Ltd., and Woolcock, J. W. Production of nitrogenous compounds. 16,300. May 27.

—— Percussion caps, etc. 16,441. May 28.

Imperial Chemical Industries, Ltd. and Lumsden, C. H. Manufacture of *o*-aminophenols. 16,610. May 29.

—— Collection of sulphur. 16,910. May 31.

—— Manufacture of dyestuffs. 16,911, 16,912. May 31.

Kali-Chemie Akt.-Ges. Purification of hydrogen peroxide solutions. 16,234. May 26. (Germany, June 15, 1929).

Kane, T. and Strange, E. H. Hydrolysis of alkyl chlorides, etc. 16,843. May 31.

Kath, A. Low-temperature distillation of carbonaceous material. 16,168. May 26.

Laing, B. Separation of liquids and dehydration of tars, etc. 16,352. May 27.

Nielsen, H. and Neilsen, O. W. Separation of liquids and dehydration of tars, etc. 16,352. May 27.

Physical Chemistry Research Co. Production of liquid hydrocarbons from solid fuels. 16,757. May 30. (Belgium, June 4, 1929).

Piggott, H. A. and Rodd, E. H. Manufacture of dyestuffs. 16,911, 16,912. May 31.

Soc. of Chemical Industry in Basle. Manufacture of metalliferous dyestuffs. 16,201. May 26. (Switzerland, May 25, 1929).

—— Manufacture of metalliferous dyestuffs. 16,497, 16,498. May 28. (Switzerland, May 28, 1929).

—— Manufacture of cellulose derivatives. 16,638. May 29. (Switzerland, July 27, 1929).

El Salvador Consumes More Paint Products

THE market in El Salvador for paints, although limited by the small population, is gradually gaining in importance as a consumer of imported paints. Reasons cited for sales expansion are improved standards of living and active building construction. Popular paints purchased are cold water and paste paints, but ready-mixed paints are being utilised in larger quantities. El Salvador is an agricultural country and manufacturing industries are few. The largest users of paints are two railroads and furniture manufacturers. Paints and varnishes are also employed for finishing the interiors and exteriors of buildings. Manufacturers who contemplate entering the trade should take into consideration the excessive heat throughout the year and the heavy tropical rains which are detrimental to paints. Total imports into El Salvador of paints, pigments and varnishes in 1927 amounted to 267,491 kilos, valued at $92,291. This quantity was surpassed during 1928 when imports reached 457,407 kilos, having a value of $159,879.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID, CHROMIC.—1s. 0¾d. per lb. d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8¼d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9¾d. and 10¼d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3¾d. per lb. Liquor, £18 15s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4¾d. per lb. nett d/d U.K. spot; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8¼d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K. spot. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¼d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in returnable casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 7½d. per lb. Crude 60's, 2s. 2d. to 2s. 5d. June, 2s. to 2s. 1d. July-Dec. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 6d. per gall. B.P., 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. to 2s. 2d. Dark, 1s. 6d. to 1s. 9d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6¼d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 11d. per gall. Pure, 1s. 11d. to 2s. 3d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6¼d. to 6¾d. per gall. Home, 4d. per gall. d/d. Middle oil, 4¼d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1¼d. to 1¾d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 1s. to 1s. 2½d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £4 10s. per ton. Hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Flaked, £14 to £15 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8¼d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8¼d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8¼d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9¼d. per lb., in ton lots.

DICHLORANILINE.—1s. 10d. per lb. f.o.r. works.

DIMETHYLANILINE.—Spot, 1s. 9¼d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb. f.o.r. works.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb, 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 1d. per lb. ex works.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.

CARBON BLACK.—4 1/16d. to 4½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—3s. 6d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6½d. to 1s. 7½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 2d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 8d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other graviti es at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb. for 28 lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 2s. 4d. to 2s. 7d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 17s. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENAZONE.—5s. 6d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—95s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125 lb. kegs
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—1s. 11d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 3d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—11s. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—8s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 6d. per lb.
GERANIOL (PALMAROSA).—18s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. 6d. per lb.
ISO EUGENOL.—11s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—46s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—13s. 6d. to 15s. per lb. Ex Guaiacol, 12s. 6d. to 13s. 9d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.
ANISE OIL.—5s. per lb.
BERGAMOT OIL.—10s. 6d per lb.
BOURBON GERANIUM OIL.—20s. per lb.
CANANGA.—Java, 9s. 9d. per lb.
CASSIA OIL, 80/85%.—4s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 7d. per lb., c.i.f. U.K. port.
LAVENDER.—Mont Blanc, 38 to 40%, 11s. per lb.
PALMA ROSA.—10s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, June 5, 1930.

THE improved demand for the various chemicals has been maintained during the current week, with prices on the whole firm. Export business also continues fairly satisfactory.

General Chemicals

ACETONE.—Firm at £71 10s. to £80 per ton, according to quantity, and in steady request.

ACID ACETIC.—Unchanged and firm at £36 10s. per ton for 80% technical and £37 10s. for 80% edible, and is in good and steady demand.

ACID CITRIC.—Very quiet at about 1s. 6¼d. to 1s. 7d. per lb., less 5%.

ACID LACTIC.—Firm at £42 per ton for 50% by weight, pale quality, and in steady request.

ACID OXALIC.—Firm at £30 7s. 6d. to £32 per ton, according to quantity.

SULPHATE OF ALUMINA.—Unchanged at £8 to £8 15s. per ton for the 17/18% iron free quality.

ARSENIC.—Steady at £15 15s. per ton, free on rails at mines.

CREAM OF TARTAR.—Quiet at 94s. to 95s. per cwt., ex wharf London.

COPPER SULPHATE.—Firm at £21 10s. to £22 per ton, free on rails at mines.

FORMALDEHYDE.—Steady at about £33 10s. per ton and in good demand.

LEAD ACETATE.—Unchanged at £40 5s. for white and £39 5s. for brown and in fair demand.

LEAD NITRATE.—£30 to £32 per ton, according to quantity.

LITHOPONE.—Steady at £19 15s. to £23 per ton, according to quantity and grade, and in regular demand.

CARBONATE OF POTASH.—Continues steady at £27 per ton for 96–98% arsenic free quality and in fair demand.

PERMANGANATE OF POTASH.—Firm at 5½d. per lb., for B.P. quality, with quite a good demand.

SODIUM BICHROMATE.—Unchanged at 3⅝d. per lb., and in steady request.

SODA HYPOSULPHITE.—Photographic crystals in good request at £14 15s. per ton, commercial quality at about £8 10s. to £9 per ton.

SODIUM SULPHIDE.—Unchanged at British makers' prices.

TARTAR EMETIC.—Rather slow at about 11d. per lb.

ZINC SULPHATE.—Firm at about £12 10s. per ton.

Coal Tar Products

The coal tar product market remains unchanged from last week. Benzols and solvents appear to be getting scarce, thus prices are holding firm. Creosote oil also shows signs of recovery. Cresylic and naphthalenes remain dull.

MOTOR BENZOL.—Firm at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Remains firm at about 1s. 2½d. to 1s. 3d. per gallon, f.o.r.

HEAVY NAPHTHA.—Quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL.—Remains at 3d. to 3½d. per gallon, f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Unchanged at 2s. per gallon for the 98/100% quality, and at 1s. 10d. per gallon, ex works, for the dark quality, 95/97%.

NAPHTHALENES.—The firelighter quality is quoted at £3 10s. to £3 15s. per ton, the 74/76 quality at £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.

PITCH.—Quoted at 40s. to 45s. per ton, f.o.b. East Coast port.

Nitrogen Fertilisers Prices

SULPHATE OF AMMONIA.—*Export.*—Producers are still offering at £7 15s. per ton f.o.b. U.K. port in single bags, for neutral quality, basis 20·60% nitrogen, but at this end-season period few purchases are made, and buyers tend to hold off.

Home.—The home demand continues small. It is expected that orders for this season will come to an end shortly. Buyers are now discussing forward prices, but it seems certain that the new scale will be lower than that for 1929/30. Up to the present there is no indication of what it will be.

NITRATE OF SODA.—There is no change in the position of this product.

Latest Oil Prices

LONDON, June 4.—LINSEED OIL was steady but quiet at 5s. to 2s. 6d. per ton advance. Spot, ex mill, £43 10s., nominal; June, £40 10s.; July-August, £39; and September-December, £37 7s. 6d., naked. RAPE OIL was dull. Crude extracted, £37; technical refined, £38 10s., naked, ex wharf. COTTON OIL was quiet and 10s. per ton lower. Egyptian, crude, £28 10s.; refined common edible, £33 10s., and deodorised, £35 10s., naked, ex mill. TURPENTINE was quiet and 3d. per cwt. lower. American, spot, 38s. 9d.; July, 39s.; July-December, 39s. 9d.; Russian, spot, 36s. 3d.

HULL.—LINSEED OIL.—Spot, £42; June, £41 10s.; July-August, £40; September-December, £38 5s. per ton, naked. COTTON OIL.—Egyptian crude, spot, £28; edible refined, spot, £31 5s.; technical, spot, £31; deodorised, spot £33 5s. per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £30 15s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, spot, £31 10s.; deodorised, spot, £35 10s. per ton. SOYA OIL.—Extracted and crushed, spot, £29; deodorised, spot, £32 10s. per ton. RAPE OIL.—Crushed-extracted, spot, £36; refined, spot, £38 per ton. TURPENTINE, CASTOR OIL and COD OIL unaltered.

South Wales By-Products

SOUTH Wales by-product activities remain unsatisfactory. The demand for most products is slow and sporadic, and, with the holidays ahead, it is unlikely there will be an improvement during the next few weeks. Pitch has a very poor call, with values unchanged, and a similar remark applies to creosote and heavy naphtha. Solvent naphtha has a fair call, while motor benzol is in brisk and steady request. Quotations are unchanged in each case. The demand for refined tars is fairly good, quotations for coke-oven and gasworks tar being unchanged. Road tar has a fair demand at about 14s. per 40-gallon barrel. Patent fuel and coke exports remain unsatisfactory. Patent fuel quotations, for export, are as follows:—22s., ex ship Cardiff; 20s. to 21s., ex ship Swansea and Newport. Coke prices are:—Best foundry, 36s. to 37s.; good foundry, 30s. to 32s. 6d.; and furnace from 25s. to 27s. 6d. Oil imports during the last four ascertainable weeks amounted to 18,159,450 gallons.

Scottish Coal Tar Products

THE lack of demand for tar-acids has caused a slight drop in values during the week, but the position in Scotland is not so acute as it is in England. Motor benzol continues firm with supplies short.

Cresylic Acid.—Quotations are easier for prompt delivery, but the forward position remains steady. Pale 99/100%, 1s. 10d. to 1s. 11d. per gallon; pale 97/99%, 1s. 9d. to 1s. 10d. per gallon; dark 97/99%, 1s. 8d. to 1s. 9d. per gallon; high boiling, 1s. 9d. to 1s. 11d. per gallon; all ex works.

Carbolic Sixties.—The value is unchanged at the quivalent of 2s. 4d. to 2s. 6d. per gallon for ordinary quality.

Creosote Oil.—While very few orders are passing production is low and distillers are themselves utilising surplus supplies. Specification oil, 3d. to 3¼d. per gallon; gas works ordinary, 3d. to 3¼d. per gallon; washed oil, 3¼d. to 3¾d. per gallon; all f.o.r. makers' works in bulk quantities.

Coal Tar Pitch.—The nominal value is unchanged at 47s. 6d. per ton f.a.s. Glasgow for export. Home orders are scarce with quotations easy at about 50s. per ton f.o.r. works.

Blast Furnace Pitch.—Very few orders are passing and the fixed prices remain at 30s. per ton f.o.r. works for home and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Surveyors are taking advantage of the continued dry spell to rush forward their road work. Quotations remain firm at 3½d. to 4d. per gallon ex makers' works in buyers' packages.

Blast Furnace Tar.—Very quiet at 2¾d. per gallon.

Crude Naphtha.—Valued at about 4d. to 4½d. per gallon f.o.r. works in bulk.

Water White Products.—The demand is improving and quotations tend upwards. 90/160 solvent is 1s. 3d. to 1s. 4d. per gallon; 90/190 is 1s. 0½d. to 1s. 1½d. per gallon; motor benzole is 1s. 6½d. to 1s. 7d. per gallon; all naked at makers' works.

New Benn Books

A FORTHCOMING publication by Ernest Benn, Ltd., is *Modern Physical Chemistry*, by Dr. F. H. Constable, 10s. 6d. net, a textbook designed to give a compact and comprehensive account of what is virtually a new branch of either physics or chemistry, treated from the mathematical standpoint. The publication programme also includes *"Gas World" Analysis of Gas Companies' Accounts*, 21s. net; *Fights and Flights*, by Air-Commodore C. R. Samson, 21s.; *My Memoirs*, by Sir Frank Benson, 21s.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, June 4, 1930.

DURING the past week the Scottish heavy chemical market has shown a marked improvement as compared with last week's report, and there is every possibility of this improvement continuing, the bulk of inquiries received being for export business. Prices on the whole remain steady.

Industrial Chemicals

ACETONE, B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports. 80% pure, £37 10s. per ton, ex wharf. 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Granulated £22 per ton; crystals £23 per ton; powder £24 per ton, packed in 1 cwt. bags, delivered free Great Britain in one ton lots and upwards.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at the same price, viz.: 3¾d. per lb., ex store. Offered from the Continent at 3¾d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f., U.K. ports. Crystal Meal about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f., U.K. ports.

ANTIMONY OXIDE.—Rather easier and spot material now obtainable at round about £34 per ton, ex wharf. On offer for prompt shipment from China at about £30 per ton, c.i.f., U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f., U.K. ports. For Continental material our pirce would be £10 per ton, f.o.b., Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacture contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Now quoted £35 per ton, ex store. Continental material now on offer at about £34 per ton, ex wharf.

GLAUBER SALTS.—English material, quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2% delivered.

POTASSIUM BICHROMATE.—Quoted 3⅞d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store. Offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—99¾/100% Powder. Quoted £25 10s. per ton, ex wharf. Crystals 30s. per tón extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE | B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted at 7d. per lb., ex store. Offered for prompt delivery from the continent at about 6¾d. per lb., ex wharf.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station, M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb., delivered buyer's premises with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay minimum four-ton lots with various reductions for contracts.

SODIUM CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums; £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums; £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' stations, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £10 2s. per ton, carriage paid buyers' sidings, minimum five-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered for unground quality. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid, 61/62%, £9 15s.; broken, 60/62%, £10 15s. per ton; crystals, 30/32%, £7 17s. 6d. per ton, all delivered buyers' works on contract minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC.—Chloride 98%.—British material offered at round about £20 per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

The Uses of Fluorspar

Canadian Resources

A REPORT on the Canadian deposits of fluorspar, for which there is a large variety of chemical and other uses, has been published by the Geological Survey, Dominion Department of Mines, Ottawa. Fluorspar or fluorite is a non-metallic mineral of importance but it is a mineral that is not produced in great quantities, the world production seldom exceeding three hundred thousand tons.

It is used as a flux in metallurgical industries, it enters into the composition of enamels and certain kinds of glass, and is used in the manufacture of artificial cryolite, a flux for the recovery of aluminium. It is employed in the chemical industry for the manufacture of hydrofluoric acid and other fluorine compounds; transparent colourless varieties are used for optical purposes.

Fluorspar is widely distributed throughout Canada but most of the known occurrences are of mineralogical interest only. There are two producing localities, near Madoc, Ontario, and near Grand Forks, British Columbia. There was no production in 1926 to 1928. The output for 1929 was 70 tons from Ontario, and 17,870 tons from British Columbia.

The deposit worked at the Rock Candy mine, near Grand Forks, British Columbia, consists of one large ore-shoot made up of an intricate network of more or less parallel replacement veins varying in width from a few inches to thirty feet in a mass of syenite. At Madoc, Ontario, the mineral occurs in veins in nearly horizontal Palaeozoic sediments and in the pre-Cambrian complex on which the Palaeozoic sediments rest.

This report is one of a series on economic geology being published by the Geological Survey. Other volumes of the series deal with the talc deposits and the arsenic deposits of Canada, the iron ores of British Columbia and Yukon, and oil and gas in western Canada (stock now exhausted), and there is a general report on the geology and economic minerals of Canada.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, June 5, 1930.

No more than a quiet to moderate business at the best is being done in most sections of the chemical market in this area so far as new bookings are concerned, for in a good many instances consumers are becoming increasingly cautious from the point of view of prices in committing themselves ahead. For a long time now steady to firm conditions in chemicals have been pretty general, but in more than one line during the past week there has been a shading of prices. Due to the Whitsun holidays, sales on the Manchester market next week are expected to be at a very low ebb.

Heavy Chemicals

Among the soda compounds the outstanding feature from the point of view of price movements has been a reduction of ¼d. in bichromate, the new basis being 3⅜d. per lb., less varying rates of discount for bulk orders. Chlorate of soda is virtually unchanged on the week at round £25 per ton, with sales only on very moderate lines. Caustic soda is firm at from £12 15s. to £14 per ton, in contracts, and a quietly steady movement is reported. There is a moderate inquiry about in the case of bicarbonate of soda, offers of which are maintained at round £10 10s. per ton. Prussiate of soda is on offer at from about 4⅜d. to 5¼d. per lb., according to quantity, a quiet business being put through. Sales of sulphide of sodium are on a rather limited scale, with the commercial material quoted at about £8 per ton and the 60–65 per cent. concentrated solid at £10. There is some inquiry about for hyposulphite of soda on the basis of £15 5s. per ton for the photographic grade and £9 for the commercial. With regard to alkali, values are well held at about £6 per ton, with sales on a quietly steady scale. Phosphate of soda is only in quiet demand at the moment, but at up to £11 10s. per ton for the dibasic quality values show no sign of giving way. There is no great weight of business going through in the case of saltcake, with current offers of this material ranging from about £2 15s. to £3 per ton.

A reduction of ¼d. in the basis price has also been made in bichromate of potash, 4⅛d. per lb. being the new rate. Only a quiet demand is being experienced for chlorate of potash, with current values in the neighbourhood of £26 per ton. A moderate inquiry for yellow prussiate of potash has been reported here during the past week, and offers are firm at from 6¾d. to 7¼d. per lb., according to quantity. Although still on the easy side, there has been little further change in the price position of carbonate of potash, to-day's values being at up to £25 10s. per ton. Permanganate of potash is a somewhat quiet section of the market, with the B.P. grade quoted at about 5½d. per lb. and the commercial at 5¼d. There is not a great deal of inquiry about for caustic potash, but prices remain at round £31 per ton.

Trade in sulphate of copper is only of moderate extent, and at round £24 10s. per ton, f.o.b., values are rather uncertain in tendency. Buying interest in the case of arsenic is subdued, with offers this week at about £15 15s. per ton at the mines for white powdered, Cornish makes. Business in the lead products has been on a limited scale; nitrate is quoted at about £29 per ton, and white and brown acetate at £37 and £36. There is a quiet demand about for acetate of lime at about £15 per ton for the grey and £7 10s. for brown.

Acids and Tar Products

Both citric and tartaric acids are still moving towards lower levels, and limited sales have been made during the past week at about 1s. 7¾d. and 1s. 2½d. per lb. Oxalic acid, however, has been about maintained at £1 12s. per cwt., ex store, though inquiry at the moment is quiet. There is a moderate demand about in the case of acetic acid, and quotations in this section seem to be steady at about £66 per ton for the glacial kind and £36 10s. per ton for the commercial 80 per cent. grade.

The by-products generally are in quiet request, although there has been no further material change in the price position. Pitch is nominal at round 47s. 6d. per ton, f.o.b., with creosote oil ranging from about 3d. to 4d. per gallon, naked, according to quality. Crude carbolic acid is in moderate demand at up to 2s. 6d. per gallon, with crystals rather slow at 7¼d. per lb. Solvent naphtha is on the easy side at about 1s. 2d. per gallon.

Company News

Neuchatel Asphalte Co.—The directors recommend, subject to audit, a dividend for the year 1929 of 5 per cent. (1s.) per ordinary share, less tax, payable on June 27. After deducting dividend recommended, carry-forward will be increased by £618.

Scottish Oils.—The accounts for the year to March 31 last show a balance on profit and loss, including £46,436 brought in, and after providing for depreciation and writing down investments in subsidiary companies, of £229,841. After payment of the final dividend on the preference shares, a balance of £66,489 is carried forwgrd.

Broughton Copper Co.—For the year ended March 31, 1930, the accounts show a profit of £14,661, to which is added brought forward of £1,526, making £16,187. Interim dividend on preference shares for half-year to September 30, 1929, paid December 2, 1929, absorbs £15,937, leaving a balance of £250, which directors recommend be carried to new account.

Boots Pure Drug Co.—The net profits for the year ended March 31, 1930, were £724,869, as compared with £750,152, and, adding the amount brought in, there is available £951,579, against £958,459. The ordinary dividend and bonus of 24 per cent. and 5 per cent. respectively, as already known, are maintained, but reserve receives £190,000, as against £200,000 last year, and £229,829 is carried forward, as against £226,710 brought in.

Acetate and Acetate Products (Foreign Rights).—The accounts for the period October 20, 1928, to December 31, 1929, show a loss of £8,837. The directors state they have been actively engaged in negotiating the sale of the company's patents. Arrangements contemplated in France and Belgium have been delayed pending completion of factories of English companies. All these factories will, the directors understand, be in operation by the early autumn. Action has been taken against underwriters in respect of unpaid calls, and from this source, as well as from other amounts in arrear, a substantial sum should be recovered. Sundry creditors total £6,224, of which £5,014 is due to main underwriters. The Board has been advised to withhold payment until underwriters have saisfied their liabilities. Balance sheet includes patents, patent applications and rights at cost £100,000, and preliminary and formation expenses £20,855. Calls in arrear total £25,367, and the auditors state that the greater part of amounts in arrear on shares is due from underwriters and sub-underwriters, and may prove irrecoverable. 120,663 shares have been allotted to sub-underwriters, whose cheques for application money were dishonoured.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to June 21, 1930.

Perfundol.

512,186. Class 1. Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. I.G. Farbenindustrie Aktien-Gesellschaft (a joint stock company organised under the laws of Germany), Mainzerland-strasse 28, Frankfort-on-Main, Germany; manufacturers. April 16, 1930.

Duracaine.

501,792. Class 3. Chemical substances prepared for use in medicine and pharmacy. May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11; manufacturers. April 15, 1929.

Elityran.

512,279. Class 3. Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers. April 23, 1930.

You need

sound fire protection if, when that outbreak of fire occurs, prompt extinguishment is to be assured. To have fire extinguishers at hand is not sufficient unless they are of the right type for the risk which they protect. An appliance may be suitable, from every point of view, for installation in an office, but it may be worse than useless in another part of the works.

There is a unit of Foamite Protection for every risk, no matter what the nature, and Foamite Engineers will, without obligation, survey premises and make recommendations.

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Telegrams: Foamite, Wesdo, London.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

STOTT MILTON AND CO., Oxford Works, Siddal, Halifax, wholesale chemists. (C.C., 7/6/30.) £15 13s. April 30.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

DELAPENA AND SON, LTD., London, W.C., dealers in oil products, etc. (M., 7/6/30.) Registered May 26, £1,000, £600 and £350 charges, to F. Partridge, 26, King Street, St. James, J. W. Doorley, Mount Pleasant, Parkmead, S.W.15, and E. Salthouse, 42, Lanchester Road, N.6; general charges.

KODRYSO, LTD., London, E.C., soap manufacturers. (M., 7/16/30.) Registered May 31, £200 debenture to H. Edmonds, 647, Salisbury House, E.C.; general charge.

Satisfaction

LEVER BROTHERS, LTD., Port Sunlight, soap manufacturers. (M.S., 7/6/30.) Satisfaction registered May 23, £12,850, part of £15,000,000, registered April 13, 1921.

London Gazette, &c.

Companies Winding Up Voluntarily

CHEMICO ELECTRIC CO., LTD. (C.W.U.V., 7/6/30.) By special resolution, May 26th. A. J. Bennell, 7 and 8, Norfolk Street, Strand, London, W.C.2, appointed as liquidator.

ERRYRYS SILICA AND SPAR CO., LTD. (C.W.U.V., 7/6/30.) By reason of its liabilities, May 26th. W. C. Hughes, Ashleigh, Earl Road, Mold, appointed as liquidator.

TIDEWATER OIL CO. (ENGLAND), LTD. (C.W.U.V., 7/6/30.) By special resolution, May 27. J. V. Delves, 95, Brighton Road, Coulsdon, Surrey, company director, appointed as liquidator.

New Companies Registered

IODINE PRODUCTS, LTD., 125, Pall Mall, London, S.W.1. Registered May 29. Nominal capital, £1,000 in £1 shares. Chemists, druggists, drysalters, oil and colourmen, etc.

ISLEWORTH LUBRICANTS, LTD., Fourth House Wharf, Church Street, Isleworth.—Registered May 29. Nominal capital, £1,650, in 1,350 6 per cent. non-cumulative preference shares of £1 each and 6,000 ordinary shares of 1s. each. To adopt an agreement with R. A. Mant, and to carry on the business of merchants and manufacturers of and dealers in graphite, plumbago, and all products, compounds and preparations of graphite or plumbago, paints, oils, lubricants, greases, crucibles, retorts, ovens and any other plant, engineers' factors, etc. Directors: R. A. Mant, and Mrs. L. W. Mant.

UNIVERSAL INDUSTRIAL DEVELOPMENTS, LTD., 160, Windsor House, Victoria Street, London, S.W.1. Registered as a "private" company on June 3. Nominal capital, £25,000 in 8,500 10 per cent. preference shares of £1 each and 66,000 ordinary shares of 5s. each. The objects are to adopt agreements with (*a*) F. W. Baker, (*b*) S. R. Mullard, (*c*) O. D. Lucas, (*d*) Sir George Thurston, K.B.E., (*e*) A. J. Antoine Lindeboom, (*f*) C. P. Adcock, and (*g*) the Prairie Syndicate, Ltd.; to carry on business as organisers and developers of all kinds of chemical, engineering, physical, scientific and general businesses and undertakings, bankers, financiers, capitalists, concessionaires, agents, exporters and importers, manufacturers of and dealers in chemicals, gases, drugs, medicines, salts, acids, compositions, etc. Directors: Sir George Thurston, E. Heath-Jones, F. W. Baker, S. R. Mullard, O. D. Lucas, A. J. A. Lindeboom, C. P. Adcock.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

AUSTRALIA.—The Victorian Railways Commissioners are calling for tenders, to be presented by July 30, for the supply and delivery of renewals for caustic soda primary cells. Ref. B.X. 6441.

CANADA.—Agencies for the sale of fluorspar, glass bottles and aluminium foil are required by a Montreal firm of commission agents for metals, chemicals and raw materials. Their selling organisation covers the whole Dominion and they wish to work on a commission basis and to deal with manufacturers or producers only. Ref. No. 459.

Tariff Changes

GREECE.—As from May 2 the "Minimum" tariff duty on silicate of soda or potash, solid or liquid, will be 15 metallic drachmæ per 100 kilog. instead of 8.

POLAND.—By virtue of an Order effective from May 13 to June 30, duties on the following imported goods are payable at the percentages of the normal tariff duty specified:—Potassium permanganate, imported under permit from the Ministry of Finance for the manufacture of electrolytic zinc, 20 per cent.; benzaldehyde, imported for the manufacture of synthetic dyes, 15 per cent.; accessories and articles made of precious metals, imported for scientific and technical purposes, duty free.

The Nitrate Merger

Five Years' Profit Estimate

FURTHER particulars of the new £75,000,000 company, "Cosana," now being formed in Chile to combine the interests of the various nitrate producing companies, have been given this week by Aikman (London), Ltd. The new company proposes to assume as a first charge all debts, debenture and preference shares of those producers which are still going concerns, and to effect a compromise with those who, although they have plants and nitrate grounds, are unable to work. The total indebtedness of this nature is estimated at about £30,000,000, the annual charge on which for interset and redemption will amount to approximately £3,000,000 per annum. It proposes to raise immediately by the issue of a preferred security £5,000,000 as working capital for existing plants and £12,000,000 for the purpose of erecting two new process plants, each to produce 700,000 tons per annum, the actual cost of erection being estimated at £9,000,000, with £3,000,000 as working capital. It is expected that these plants will be in production towards the end of 1932. The interest and amortisation on them is estimated at £1,360,000, so that the annual service on the total prior charges as above will amount to about £4,360,000.

An estimate of the probable profits that may be made by "Cosana" during the next five years, after deducting the full service of the prior charges referred to above, is given below:—

July, 1930, to June, 1931	£4,000,000
July, 1931, to June, 1932	5,000,000
July, 1932, to June, 1933	6,500,000
July, 1933, to June, 1934	8,000,000
July, 1934, to June, 1935	9,000,000

These figures are calculated on the basis of prices in consuming markets being fixed at an average of £1 per ton lower than during the past year, although such a large reduction is not at present contemplated. Conversations between the German and British synthetic nitrogen producers and the minority group continue, and it is expected that the negotiations with the Chilean industry will be adjourned until an agreement between the former is reached.